FOOD MANUFACTURE

Incorporating Food Industries Weekly

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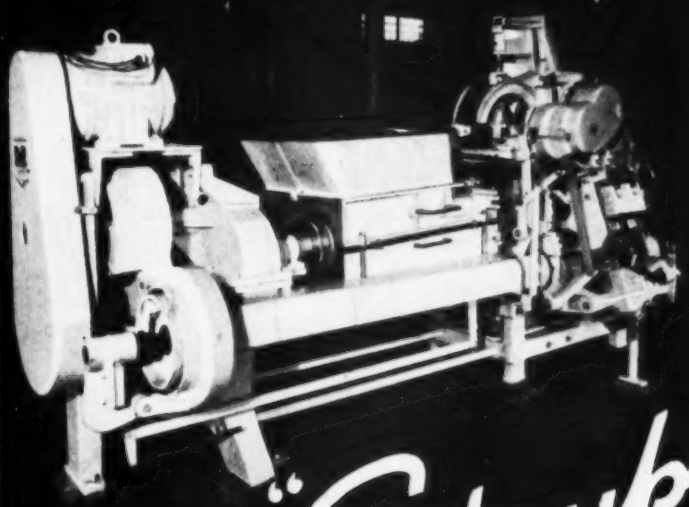

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FOOD MANUFACTURE

Vol. XXII, No. 2 February 1, 1947

Plant Priorities

A CONFERENCE on exports savours of academic interest to most food manufacturers at this juncture. The question of plant supplies is of vital interest to the industry, however, and one which recurred in speech after speech at the conference organised by the Federation of British Industries in London recently.

Two schools of thought were apparent. The majority pressed for retention of more capital machinery to re-equip home industry. It was held that by exporting plant Britain was building up dangerous competitors and that the manufactured goods which could be produced from it at home would form a more reliable and continuing source of exports, if momentarily less spectacular. The fate of the Lancashire cotton industry between the wars and the effect of Japanese competition were cited to illustrate the folly of encouraging the growth of industry abroad.

The opposite case for linking up export policy with the development and prosperity of overseas countries was ably put by Sir Frederick Bain, deputy chairman of Imperial Chemical Industries, Ltd., and deputy President of the F.B.I.

Sir Frederick, in suggesting that the same principles should be applied to overseas trading as to the home market, implied that the world—commercially—should be treated as one market. This could best be achieved by establishment of the manufacturer's own overseas selling organisation, for which he claimed the advantages of direct contact with the buyer, individual attention to his interests, propaganda and prestige value, and more detailed knowledge of the market. He recommended that such an organisation should co-operate with Government departments in supplying technical service in the use of existing products and development of the use of new ones.

In the interest of export trade, paradoxical though it might seem, it was essential in some cases for U.K. manufacturers to enter into local manufacture. To fall in with a country's aspirations to render itself independent or partially independent of imports of a particular product was in accordance with the policy he had enunciated of linking up with a country's development.

Sir Frederick pointed out that if the local industry were inefficient British exports might be kept out by tariffs imposed to protect it. By entering into local manufacture the U.K. industrialist was in a stronger position to obtain imports needed for the balance of the market. Where local manufacture was established, moreover, governments frequently co-operated in stimulating demand for its products. Lastly, Sir Frederick emphasised, if the British manufacturer did not seize the opportunity someone else would.

Future of Marketing Boards

The belief is held in political and industrial circles that the inter-Departmental Committee of Inquiry into the working of the Agricultural Marketing Acts may recommend the abolition of some of the marketing schemes that were established before the war. The reasons for this belief are that the main purposes for which some of them were established have ceased to exist with the establishment of a permanent Ministry of Food, and that there would be no object in mulcting registered producers in levies to support redundant bodies.

The main pre-war marketing boards concerned with food manufacture were the Bacon, Bacon Development, Potato, Milk, and Milk Products Boards. The last-named never functioned at all as the war broke out on the eve of the initial polls on the five "regulated products," and the Bacon Development Board was a co-ordinating body between the Pigs and Bacon Marketing Boards.

Since 1940 the supplies available to manufacturers of milk, potato and pork products, and the prices payable for them, have been determined by the Ministry of Food which has, in fact, concen-

trated the bacon and creamery industries in the national interest during the war.

There is a large body of opinion both at Westminster and in industry that the Ministry of Food should continue to control the prices and quantities of raw materials used in food manufacture, particularly as the Government has decided to make permanent the system of guaranteed prices and markets to home farmers.

When the Williams Committee on Milk Distribution met representatives of the milk distributive trade a member of the Committee asked a number of pertinent questions which sought to elicit whether the proposed Milk Distributors Marketing Board would serve any useful purpose now that the Food Ministry has been given permanent status. Those questions are believed to apply equally to some of the marketing boards that are at present dormant.

B.I.O.S. Reports on German Research

The exhibition on German industry at the Board of Trade, organised by the British Intelligence Objectives Sub-Committee, has the object, as Sir Stafford Cripps said in opening it on December 9, of encouraging " smaller firms who have not their own research departments to allow B.I.O.S. to help them to introduce the latest manufacturing methods and processes." If it succeeds in so doing it can only be by whetting the appetite for more. The exhibition consists of graphs, figures, and illustrations showing the work of B.I.O.S. and a survey of its industrial reports, so general, covering so wide a field so scantily, that the visitor interested in one particular industry—as all must be, since admission is only by trade card —is doomed to disappointment.

The responsibility for this display of generalities must fall more on those who allocated the space for the exhibition than on the designers, who have obviously done their work with enthusiasm. In the room—it can scarcely be called a hall —allotted to them they had to choose between presentation of a detailed, factual survey of reports on one or two industries, which would have interested only a limited number, or else a general survey of the activities of B.I.O.S. In adopting the latter course one cannot help but feel they have interested no one. Interest has, in fact, been sacrificed in the cause of brevity, doubtless because the exhibition was designed to travel—it appeared in Birmingham on January 20, and later in Nottingham, Cardiff, Manchester, Leeds, Newcastle, Glasgow, Belfast, and Bristol.

That is not to underrate the achievements of B.I.O.S. itself. It is precisely because the exhibition does not do justice to the magnitude of the work of the 10,000 investigators who have visited Germany that it is disappointing. If that disappointment drives the beholder to enquire further from B.I.O.S., or to buy its reports, of which H.M.S.O. has already sold and circulated nearly a million, the exhibition will have achieved something.

The latest lists of reports available ranging in price from 6d. to 55s., in subject from a method for excavating tunnels to the manufacture of cigarettes, give some idea of the service available to industry.

To quote Sir Stafford again: "Here then is an opportunity, not to do the research which is costly and slow, but to take full advantage of all the intensive research in Germany throughout the war years. All of it will become out-of-date, some sooner than others, so that there is no time to waste if we are to get the full advantage of all this effort."

Ice Cream Powder Deal

Although ice cream manufacturers are still forbidden by the Use of Milk (Restriction) Order to use milk or milk products, a fair quantity of ice cream containing milk solids is now being legally manufactured and sold.

The Ice Cream Alliance has completed a £30,000 deal by purchasing 50,000 tins of surplus American Army ice cream powder. This product, which requires mixing with water only, is a dehydrated ice cream mix, and contains satisfactory proportions of milk fat, milk-solids-not-fat, and sugar.

The amount of the deal is several times larger than the total financial resources of the Alliance, and the powder is being sold to traders on terms that are expected to leave the trade organisation all square on the deal. A profit is not sought.

No trader is being allowed to buy more than four cases of the powder. A case contains six tins, each holding about 4¼ lb. of powder—enough to make two gallons of ice cream. The price to manufacturers is £3 15s. a case, with all faults, *ex* London.

For some months limited quantities of " salvage " evaporated milk have been offered to

the Alliance by the Ministry of Food, who issue with every consignment a licence authorising the use of the milk in the manufacture of ice cream. The Ministry has now agreed to allocate 50 per cent. of its surplus evaporated milk to the trade. Nearly 3,000 cases of 48 tins each have now been released through the Alliance.

The milk is sold *ex* depot, the Ministry declining to distribute it to the buyers. Here again the Alliance does not allow any trader to buy more than four cases, and the names of the lucky traders are selected by ballot. Experience shows, however, that a considerable number of small ice cream makers refuse to take up their allocations of evaporated milk if the depot from which it must be fetched is more than ten miles from the trader's premises. This shows a reluctance by such traders to improve the quality of their product when they have the opportunity.

Marketing Board for Tomatoes?

The spectre of foreign imports and the danger—apparent last year—of a glut of tomatoes has impelled Scottish nurserymen and growers to press for a Tomato Marketing Board. The tomato trade has operated on a basis of table quality production, nurserymen specialising in the cropping of the highest grades and qualities. The "popular" trade was left, perforce, to the Dutch and Channel Island growers, whose produce arrived earlier and was normally not of a comparable quality. The problem now facing Scottish growers in particular is that their crop matures later than either the English or the imported types and that they consequently will always suffer under any system of graduated prices which gives the highest price to the first producer.

Efforts are being made to correct this position by the development of additional glass and by the adoption of every means which may expedite cropping, but speedy air transport plus natural advantages make competition very difficult.

In Ayr, an important area for the crop, the Fruit and Vegetable Section of the County of Ayr N.F.U. has approved the adoption of a Tomato Marketing Board, and has passed this demand on to the N.F.U. for decision and action. Their case rests on the fact that glut conditions occurred last year largely through the sending of the Guernsey crop to the north of England and Scotland in the month of July at a time when the British crop was adequate, thereby depressing the demand and reducing market prices. There was evidence that but for the distribution scheme which was then in force growers would never have made their prices. There is therefore a very strong demand this year that controlled distribution should remain to protect growers against a repetition of this trouble, the more so since there is every prospect that Dutch deliveries will repeat the trouble by arriving, with Government approval, at a time when British supplies are at peak.

Efforts are being directed to press for a cancellation of foreign imports during July and half of August and to ensure that the Guernsey crop is adequately distributed over the country. These moves are particularly interesting in that tomatoes are perhaps the first food to be in glut since the end of the war. There might be some prospect that canners might benefit by this glut but for the fact that nurserymen are not anxious to grow for canning at lower prices than can be got for table use and are, in fact, seeking the cream of the market, in that they wish to dispose of admittedly high grade produce at top prices. The creation of a Tomato Marketing Board would involve the principles of maximum growing and maximum disposal, and promises a definite prospect of deliveries for many purposes for which tomatoes are presently not being diverted. It is obvious that there need be no glut of tomatoes if distribution and use were properly organised and this a Marketing Board might be expected to ensure.

Business Training Schemes

To date, some forty-eight firms in the food and drink industries have co-operated with the Ministry of Labour in setting up special business training schemes for ex-Servicemen aspiring to executive positions. Only the engineering group have bettered this figure. These schemes supplement the Ministry's three months general business training course in which management trainees are given an outline of business principles. Such men still need several months' training in their chosen industry before their employer can look on them as anything but a liability. If, however, a firm offers to take a number of men and train them, always on the understanding that there are openings for them at the end of their training, the Ministry pays the men a living allowance and the firm has no financial responsibility towards them.

By now, 4,123 men will have finished their

general business training course, but the 713 firms whose special schemes had been approved by mid-November can together absorb only 1,515 of them. Many more such courses are needed because, unless steps are taken to close the present gulf between the ages of senior and junior executives there will be a scarcity, within the next decade, of responsible men to fill the key positions in business.

The special courses vary from six months to two years and details of how they work may be obtained from the Regional Appointment Offices of the Ministry of Labour.

Canine Hysteria

Sir Ernest Mellanby's article on Diet and Canine Hysteria, in the *British Medical Journal* of December 14, 1946, has attracted more attention than it deserves and possibly more than Sir Ernest would have desired for it. He reports that he can produce hysteria in dogs by feeding them with food, the cereal part of which had been treated with nitrogen trichloride, or agene, as it is generally known in the milling trade. There is nothing really remarkable in producing hysteria in dogs, and there is certainly no ground for assuming that what produces hysteria in dogs will do the same to human beings.

Chemically, all agene does to flour is to oxidise glutathione, which activates the proteolytic enzymes. The same change occurs when flour is kept for several months and undergoes a process of natural oxidation. Sir Ernest claims that hysteria in dogs in England became very noticeable in 1924, which happens to be the year when agene was introduced. It is not correct to assume that 90 per cent. of flour was agene treated at that time. Whatever may be the proportion today, in 1924 probably only about 1 or 2 per cent. of the flour was agene treated.

Whether agenised flour is a cause of hysteria or not is doubtful, but it is certainly not the only contributory factor that has been suggested. Some authorities have claimed that mimicry spreads an epidemic. Others aver that it is caused through parasites in the ear. Hewetson, who has reported a comprehensive survey, quoted actual instances where environment undoubtedly caused the trouble. Dogs with hysteria recovered when moved away and the trouble recurred when they were put back in the original kennel. Another expert propounded a theory that hysteria only became a serious matter at about the time when short waves were used in wireless! We have known dogs to become hysterical in severe thunderstorms.

Diet may undoubtedly be a contributory factor, but it is difficult to understand why a simple oxidation process should be such a serious cause. There may be toxins in the food, fungi or moulds, deficiency of amino acids or vitamins and many other factors which appear to have been "unknown" in Mellanby's experiments. Agene has been used in increasing amounts since 1924, and we have not come across any evidence of an increase in hysteria or epileptiform fits in man during that period. There does, however, appear to be a development of hysteria in certain people at the very mention of white bread or any of the processes that go to produce it.

We have the greatest respect for Sir Ernest Mellanby's opinions, but, in this case, we must certainly return a Scottish verdict of "Not Proven."

Do you like Smoked Ham?

There is a lady named Ellen Grey, who runs a food shop. Among a number of rich and rare things she sells a smoked ham, which has not undergone the ignoble process of hypodermic tenderising. The smoking has taken six months to prepare at the —— plant in the ——. It is ready-cooked and can be eaten as it is, but you can give it a baking according to your favourite recipe without affecting the flavour.

Ellen seems to specialise in smoked things, and we gather that while her smoked salmon is something that has a special oily, piquant taste, it has been suggested that a nice way to deal with it is to alternate slices of it with smoked sturgeon on a plate (the two dissimilar flavours complementing each other splendidly), grind on an extravagant lot of black pepper, serve it with halved limes and a cruet of olive oil, and eat it with sour rye bread spread with sweet butter and sprinkled lightly with chopped olives.

The two missing words above are "Forst" and "Catskill" (U.S.A.), and Ellen trades at 800, Madison Avenue (68th), New York. We could almost think that the writer who describes her wares in the *New Yorker* was dreaming, but presumably not, thus demonstrating the truth of the adage "Half the world doesn't know how the other half lives."

Food Packaging

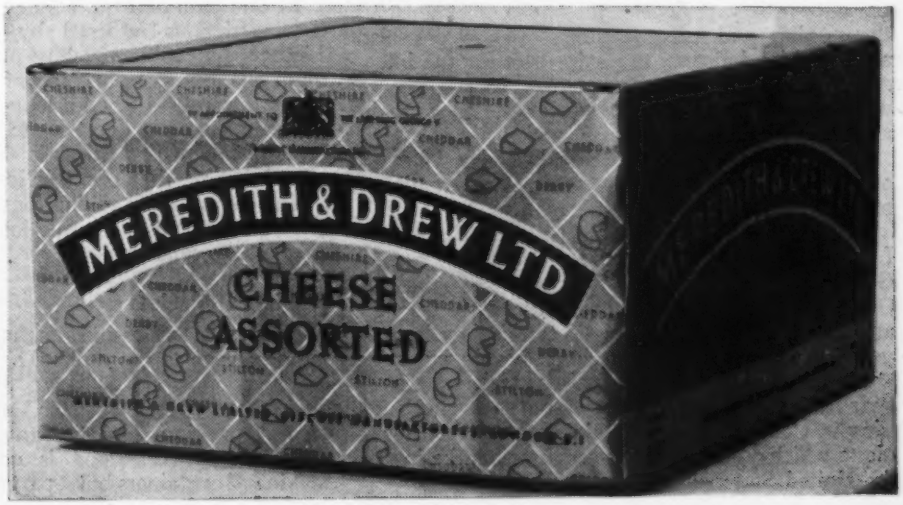
Progress in 1946

GEO. E. ROWLES.

The most significant development of the past year has been the recognition on all sides of the packaging industry of the need for research not only into the avenues likely to lead to better packaging from the preservation of goods point of view, but into those leading to more attractive appearance, ease of handling in the home and at the counter, and the package's service as an actual sales accessory. All these points are of importance and go to show from how many different angles the problem of the package must be approached. Another significant development, now that the export drive is in full swing, is recognition of the need for proper packaging for export goods so as to put British exporters in as favourable a position as are their overseas competitors. These points are touched upon in this article, as well as marketing trends in which the package plays a prominent part overseas—trends which will inevitably infiltrate into Britain in due course and from which lessons may be learned and suitable plans made.

TIME was when a package was just a package and the wholesale buyer thereof thought little about the technical points involved in its production. It would probably be true to say that the actual manufacturer of the package has devoted more attention to its perfection than have many of the large-scale users in the past. In any case, it is the package manufacturer's job to produce the best possible article—and that is a whole-time job which takes into account problems of design, printing ink, paper, methods of closing and sealing, and gadgets that will enable the housewife, at least partly, to favour a product because of the utility of the package.

In the past many food manufacturers have been bothered by problems associated with the odours of printing inks. After much research these problems have now been practically eliminated and package-buyers specify the use of quick-drying odourless ink. This is often moisture-set, on presses equipped



An example of a central theme around which individual biscuit packages have been designed. Here the theme is adapted to assorted cheese biscuits.

The effectiveness of dark printing on transparent bags by Bibby and Baron. *Courtesy Creative Journals, Ltd.*

with steam applicators which cause the ink to dry and harden immediately. In the old days it took a long time for ink to dry. This meant that waxing, folding, and die-cutting operations had to be postponed. Now these operations can be carried out as soon as the sheets come off the press.

This is of obvious advantage to packers of such items as cheese, butter, shortening, meat, cakes, biscuits, sugar, flour, sweet confectionery, and allied products.

International Rivalry

It is timely to point out that in the letter sent to the Press by the Metal Box Co. in announcing their sponsoring of a packaging competition, organised by the Central Institute of Art and Design, it was emphasised that the competition would benefit not only artists, designers, the packaging industry, the public, and manufacturers, but would also assist British industry to equip itself for the international rivalry which everyone knows must come when the markets of the world are once again adequately stocked.

This reference to international rivalry followed other warnings on the same subject by prominent men interested in the export trade.

At a luncheon meeting of sales managers in London in November, J. S. P. Armstrong, Agent-General in the United Kingdom of the Province of Ontario, urged British exporters to visit Canada and study the market on the spot. During the war years Canadian industry had developed new articles, new packages and designs, and had a five-year lead over Britain. Marketing and merchandising in Canada required a highly specialised technique which was quite different from marketing in the United States or Britain.

The temporary sellers' market, he said, was already moving into a buyers' market, and a well-organised, trained, and driving sales force was now essential if any industry was to survive in tomorrow's competitive markets.

Among the important points he made were: Britain must make products designed for overseas tastes; must organise an efficient overseas sales force and listen to its recommendations; must design her goods with high appeal and improve packaging methods; must embark on a well-balanced and consistent advertising programme and adopt the merchandising methods practised in each market.

As previously reported in FOOD MANUFACTURE, the Incorporated Sales Managers Association recently appointed a special committee, under the chairmanship of Capt. A. Tickler, to investigate and report upon the present unsatisfactory position of packaging in the export scheme, and to prepare evidence and submit a well-reasoned case to appropriate Government departments. The committee hopes to show that present restrictions on quality and type of packaging for export may permanently affect Britain's trade.

While realising the Government's difficulties, the committee feels there should be a greater and more immediate realisation at high levels that the export drive cannot be maintained if quality packaging for export cannot be planned and ordered. Instances of frustration have already been reported to the committee in cases where it has been caused by inferior packaging.

In one case a manufacturer found that, due to the restrictions imposed by the Paper Control Licence, he could only buy packaging on a minimum standard. This meant ordering in small quantities instead of on a long-term basis, with the result that package costs were heavily uneconomic and affected selling prices in the export market so adversely that the order was lost.

The committee is asking for details of such specific cases so that representations may be made in appropriate quarters.

Pooling of Brains

Packagers today must of necessity be publicity minded or go to the wall. They must be objective and they must be realistic. Packaging is closely allied to newspaper space, outdoor advertising, blocks, printing, and the graphic arts generally. This is why packaging is now not merely the making of containers but a part of the merchandising

New labels are more easily read than the old. They tie up closely with the new carton designs.

Courtesy Creative Journals, Ltd.

Greaseproof bags, loose and packed, carry the same type face. They have a clean and pleasant appearance.

Courtesy Creative Journals, Ltd.

plan which involves the pooling of the best brains in chemistry, art, and advertising work.

How truly this is recognised in Britain may be seen in the membership of PATRA. No fewer than sixty-four firms subscribe to both the Printing and Packaging Divisions, while it is further emphasised by the fact that the Packaging Advisory Panel, under the chairmanship of Mr. G. W. Severn, of Horlicks, Ltd., includes men distinguished in all branches of the industry from chemists to industrial designers.

Self-Service

Packaging, indeed, is the big news of food merchandising today, and will be bigger news in the future when, with a return to a peace that really means plenty, the swing to self-servicing in food stores will be as emphatic as its present promise. That is the one sure development to which we must look forward. It is a development which is sweeping across the world, and it will not miss this country.

It is interesting to note the progress of this development across the Atlantic, where it has influenced many food companies in competitive fields to overhaul their packaging arrangements, for it is only by noting developments there that we can properly assess the future here.

It is authoritatively stated that in the short space of eight years half of all counter-service food stores in the United States have turned to semi-self-service or have gone all the way to self-service.

According to a recent survey, self-service accounts for 59 per cent. of all grocery store sales, representing an increase of 16 per cent. over 1941. The reason given for this is that food products are sold largely by eye-appeal. The customer in these circumstances alone makes the decision to buy, and therefore the emphasis is on good packaging and identification, on visual advertising that makes people look for, recognise, and buy the advertiser's product.

Running parallel to the development of self-service in retail food stores is a pronounced rise in

"unplanned" or "impulse" buying. It is estimated that this amounts approximately to 40 per cent. of all sales in self-service food stores.

A prominent industrial designer gives these important reasons why manufacturers are paying increased attention to modern packaging:

First, it has been discovered that buyers today expect better products, and that this better quality should be reflected in the package design.

Second, more economically and more efficiently produced packages with greater sales appeal than ever before have been made possible by the use of improved materials and techniques discovered during the war.

Third, about 90 per cent. of all buying is done by women and they are more susceptible to good packaging than are men. Appreciation of colour, pattern, and design is based on emotional appeal, and women are particularly responsive to such appeals.

Labelling

Of especial interest in the matter of package labels is the news that PATRA and the American Lithographic Technical Foundation have arranged an exchange of information concerning lithographic printing developments in the two countries. Lithography is making great strides in this country, and is especially suitable for the production of multicolour labels on a large scale.

Recent investigations by the grocery manufacturers of America show some revealing facts. One is that 99 per cent. of women read labels on canned and packaged goods. They are likely to judge the quality of a product by the looks of the package and rely heavily on its appearance. Some manufacturers are already taking advantage of this, as can be seen in the colour pages of American magazines.

Women certainly like packages labelled with good design, lay-out, and type large enough to be easily read. They like illustrations on the package, preferably colour pictures, and are said to like photographs best of all.

This is not to say that a change of package or label is to be undertaken casually. Consultations with experts and adequate research are necessary if the change is to be made with a good prospect of success. Needless to say, such a change must be backed up by a wide publicity campaign.

Many food products are still Government-controlled, but this is not preventing certain prominent manufacturers and distributors from making progress in labelling even though the Government, as sole first purchasers of the products, are responsible for the quality. The labelling progress made by these manufacturers and distributors includes redesigning to meet modern display trends, and no doubt their example will be widely followed when paper supply allows. Unfortunately, although hostilities are a long way behind us, this paper supply bugbear remains to the detriment of labelling as well as of packaging. Too frequently are to be seen in retail food shops stacks of tins and cans the exteriors of which are inadequately labelled. A bare midriff is not good publicity for any canned food product, but psychology works that way.

The can has made considerable progress in public favour in Britain on its own account, and not merely because of the shortage of jars and bottles. Recent improvements in canning by means of snap-on lids have done away with the bugbear of the tin-opener and the torn thumb, and make a can with a well-designed label fit for a place on the breakfast or tea table.

The very fact that food is short here is a tremendous handicap to the packaging industry, but it is safe to say that when the shortage is removed we shall see a big advance in pre-packaged fresh foods such as graded tomatoes and other fresh vegetables, film wrapped. Indeed, experiments by various British Growers' Associations, in collaboration with package manufacturers, are being made and the goods will be delivered in due course.

World Exchange of Information

During the past year PATRA has welcomed many visitors from foreign countries who were anxious to exchange information about work carried on during the war and about work proposed to be carried on in the future. The Association has made arrangements, at the suggestion of the Packaging Institute Inc. of New York, that in exchange for copies of *Packaging Abstracts*, to be provided for their members, they would supply copies of their publications for members of the Packaging Division and act as the Information Bureau in America for PATRA's members. Such a service is obviously of the greatest help to packagers on both sides of the Atlantic.

It is interesting to note that the liaison officer of the Association's Packaging Division served on the Packaging Sub-Committee of the Council of Industrial Design in connexion with the "Britain Can Make It" Exhibition, and that the Director of Research, Dr. G. L. Riddell, was invited to be a member of the Packaging Selection Committee.

In the conclusion to his Report on the year 1945-1946 Dr. Riddell said: "The forthcoming year will be very vital for the Association, calling as it does for the planning of the future programme. One of the lessons of the war is that science, properly conducted and properly applied, can make a valuable contribution to industrial pro-

cesses. There is no doubt that this contribution can be made to the printing and packaging industries.

"The packaging industry is fully conscious of the importance of packaging in the home and export markets. Because of the war the industry in this country lacks raw materials and has not been able to develop packaging techniques to the extent which has been possible in some other countries. It is essential that this leeway shall be made up, and to this end the work of the Packaging Division will be directed."

A further design in the new biscuit series.

A New Era

The prospects of food packaging are brighter than ever before. As Sir Robert Barlow said during the year, world-wide connexions provide us with the latest technical and scientific knowledge and a new era is opening up before us.

He emphasised this in opening the conference on industrial design held during the first week of the "Britain Can Make It" Exhibition. Some knowledgeable observers say that that conference was perhaps of even more importance than the exhibition itself. Among the points made by Sir Robert was that in the last resort the problem of design was one that industry must tackle for itself, and that upon progress in this field the success of the export drive and home trade would largely depend.

World-Wide Competition

He stated bluntly that it was no use denying that some of our goods were meeting increasingly effective competition in world markets from the produce of other countries which had given close attention to the factor of design, and that even in the home market in certain ranges of commodities the foreigner before the war was having matters rather too much his own way.

Food packers are following the example set many years ago by various transport companies and others who realised that one distinctive type for use on all their display matters was of tremendous advantage in standardising the appearance of their printed publicity.

This trend is being followed widely and is sure to develop to the point that food packers and distributors must aim at distinction in labelling.

Paper Supply

The question of an adequate paper supply has been a live issue during the year. When the paper shortage will end to the benefit of better packaging has been, and still is, followed by a big question mark. The answer, of course, depends on the Government and revolves round the supply of wood pulp. There is plenty of wood in Finland, Sweden, and Canada, but how can it be made available for British paper mills?

In common with many other things, this is all a question of arrangement.

Many British paper-making machines are standing idle because of the wood pulp shortage, and until that shortage is made good packaging will suffer. The pulp bottleneck has been the subject during the year of resolutions from such diverse quarters as the annual conference of the Trade Union Congress and the Incorporated Sales Managers Association.

Future Trends

That peculiarly named industry of "paper converters" has many research staffs continually focusing attention on food packaging problems, drawing from experience covering the whole range of the food industry. It is true that the demand for converted paper products for food packaging will continue to exceed supply for some time to come, but there can be no doubt that the industry is making practical use of great technological advances in the creation of essential paper containers

and wraps of all kinds and adapting them to efficient processing for specific purposes.

These technological advances include much progress in moisture and heat resisting cartons and containers and new methods for coating, waxing, laminating, and impregnating.

Expansion in many directions may be looked for in the not-too-distant future. One of these concerns the return of "wrinkle" finishes on paper products and paper, giving them a distinctive and unusual pattern and texture. The "wrinkle" finish was a war casualty mainly due to the shortage of oils used in the process. Research on the development of synthetic drying oils is being carried out, and it is understood that British manufacturers will be licensed to use the process.

Many developments are taking place with regard to heat-sealing and spot welding as the result of experience gained in war-time packaging for military requirements. Some of the most important of these are still in the drawing office and the laboratory, however, and it will be some time before they are on the production line.

Looking forward still further we may confidently expect the time to come when all bread and similar goods are wrapped, although before the war many bakers resisted the tendency towards that end for various technical and other reasons. There is little doubt, however, that hygiene (and the housewife) will have the last word on this matter.

Such film wrappings as glassine have endless possibilities when supplies are plentiful, for they lend themselves to an infinite variety of display of many forms of food products. Not only in display, however, are such wrappings earning commendation, for the food industry is demanding more and better protection in such wraps and there will be a continuously growing demand.

The shortage of bottles is proving a fillip for plastics and other materials. A prominent engineering and management consultant, in a survey of the plastic industry, says 20 per cent. of the non-war use of plastics is for packaging. "Packaging in all its forms," he says, "uses plastic materials of many kinds in many ways, such as in coated paper for use as liners and closures for bottles of all types, in bottle-stoppers of all types, in lacquering the interiors of food containers, and in transparent sheet form for windows in envelopes and packages. Among packaging applications is that of plastic bottles. Equipment has been devised for blowing such bottles by a combination of injection and extrusion methods. In the post-war period, owing to their light weight, it is possible that the freight economy they make possible may overcome their higher cost of production as compared with glass bottles."

Effect of Cooking on Meat

REMARKABLY little is known of the chemical changes which occur when meat is cooked, either domestically or in processing, most of the published information on the subject having been concerned principally with gross phenomena such as shrinkage. Hence the study of the fundamental chemical changes occurring in lean beef during cooking which has been published by J. R. Bendall (*J.S.C.I.*, 1946, **65**, p. 226) is of considerable importance.

It was found that the principal changes in creatinine, phosphorus compounds, non-protein nitrogen, and *p*H values occurring when raw minced lean beef was (*a*) cooked at 100° C. for 1 hour, (*b*) pressure cooked at 126° C. for 3 hours, were as follows:

Creatinine.—The ratio of free to total creatinine increased from 2·1 per cent. to 44 per cent. in (*a*), and to 85 per cent. in (*b*), *i.e.* there was a large conversion of creatine to creatinine. Simultaneously there was a loss of total creatinine amounting to 8 per cent. in the case of (*b*). These changes were thought to be in part responsible for the changes in flavour which occur on cooking.

Phosphorus compounds.—In (*a*) the relative amounts of the various phosphorus fractions were little altered, but in (*b*) total soluble phosphorus and inorganic phosphorus were markedly increased, and organic phosphorus (hexosediphosphate, adenylic acid, and unidentified phosphorus) was correspondingly decreased. Data on the various phosphorus fractions of raw beef were obtained; 25 per cent. of the soluble phosphorus is present as hexosemonophosphate.

Non-protein nitrogen.—In (*a*) there was no significant increase in dialysable nitrogen and non-coaguable nitrogen, but in (*b*) these fractions increased by 51 and 58 per cent. respectively of the raw values. These changes were thought to be associated with the development of bitterness and hydrogen sulphide flavour in pressure-cooked meat.

pH values.—The *p*H of the raw meat increased from 5·85 to 6·15 in both (*a*) and (*b*). Data on the buffering power of beef juice were obtained. Changes in *p*H probably affect the texture of the meat, an increase in alkalinity causing softening.

A further point worthy of note is the unexpected liability of the proteins of meat in the presence of trichoracetic acid at 15°.

TO AUTHORS

FOOD MANUFACTURE is prepared to consider the publication of any books on scientific and technical subjects which authors might care to submit.

The Baking Industry

Progress in 1946

J. STEWART,
National Bakery School.

THE baking industry has had plenty of publicity during the past year. There has been one food crisis after another. Early in March the Ministry of Food called a conference of leading bakers to consider what steps could be taken to prevent and reduce the waste of flour, because millions of people were facing starvation in Europe and Asia. This conference recommended that bakers should not produce more bread than could be sold to consumers. Other recommendations were to avoid damaging bread in baking and handling, to encourage the sale of 1 lb. loaves in order to avoid waste of bread in the homes, to discontinue dusting rolls or bread with flour, to avoid all flour wastage, to save stale bread for human food by using it in other products or by crumbing it up for sale as breadcrumbs, and to avoid selling stale bread as animal food. These recommendations resulted in some flour saving.

To save wheat various changes have been made in the extraction rate. It first went up from 80 per cent. to 82·5 per cent., then to 85 per cent. and later up to 90 per cent., and after the harvest it was reduced again to 85 per cent.

Lighter Loaves

All these savings of wheat and flour did not solve the difficulties, and during May, in order to secure further economies in wheat and flour, the Ministry of Food ordered that the standard loaf in future would weigh 1¾ lb. instead of 2 lb., 3½ lb. instead of 4 lb., and the 1 lb. loaf was reduced to 14 oz. This change in weight was handled smoothly by bakers, while at the same time the extraction rate went up to 90 per cent. Further economies were made by reducing the output of biscuits by 25 per cent. The fat and sugar allocation for flour confectioners was also cut by 25 per cent. at this time to try and reduce the consumption still further, since the Ministry of Food thought that this would result in fewer cakes being produced, but what the Ministry of Food forgot was that bakers were not in business for philanthropic reasons, and that they could not cut their output by 25 per cent. of flour confectionery without cutting their already dwindling profits, so this cut in fats and sugar had the result that many bakers used more flour to make cheaper types of flour confectionery in order to maintain the output and profits.

Flour Subsidy

From time to time an outcry is raised against the subsidy on flour used in breadmaking, since when the price of bread is low many people are inclined to waste it, and the subsidy ties up a percentage of the bakers' capital. Thus there are two reasons for its removal, but if it were removed and bread were sold at its proper economic price it might be awkward to convince the general public that the allowed profit was not more than sufficient.

The flour subsidy was reduced as from May 5, 1946, from 9s. to 5s. 9d. per sack on flour used for breadmaking. This was supposed to be a provisional arrangement until the next costings survey, but there has been no alteration since. It has been suggested recently that about 3,000 bakers are not claiming their subsidy. While this continues, and while bakers are so lax in sending in returns of their bread costs to those who are trying to help them to get increased prices, there is little hope of getting an increased subsidy or a higher price for the bread.

Bread Rationing

The Minister of Food, Sir Ben Smith, resigned his post in May, and the present Minister, Mr. John Strachey, was appointed. It was not long before he was talking about bread rationing, and this was commenced about the end of July. It was difficult for many in the industry to see the necessity for this drastic step, since the import of flour was nearly up to the 1939 average, but there was no doubt that there were some black sheep in the baking fraternity who were selling both wheat flour and bread to farmers and others for animal feeding. The Bread Rationing Order stopped this practice to a certain extent.

It was the world wheat shortage and the fact that our stocks of wheat and flour were dangerously low that made rationing a necessity. The baking industry was up in arms against the whole scheme for a time, and might have been persuaded not to work it, but wiser counsels prevailed and it was put into practice. The Order meant a lot of extra work for shop assistants and bread roundsmen collecting the bread units, but it gradually sorted itself out. It might have been better if bakers had made less fuss over this scheme, since it was fantastic to expect any baker to check and

count the innumerable B.U.s. Lately the bakers have been absolved from counting them, but the Food Officers are supposed to check them. An actual check of B.U.s is practically impossible.

The introduction of bread rationing resulted in a slump in flour confectionery sales for a few weeks, since this was included in the Order, but this ceased when consumers found out how far their bread units would go. A difficulty was experienced by some traders in collecting B.U.s from their customers because of the exchange points scheme, but this exchange has now ended, so there is no longer any inducement for consumers to avoid handing over their bread units.

It was hoped for a time that rationing of bread would only last for three months until the harvest was gathered in, but unfortunately the weather was unfavourable and the percentage of usable flour milled from home-grown wheat was far below normal. It was thought that if bread rationing ceased rationing of flour confectionery would continue, but this proved too difficult to achieve.

Calcium Carbonate in Flour

After the introduction of the 90 per cent. extraction the rate of addition of calcium carbonate to flour was increased from 7 oz. to 14 oz. per 280 lb. of flour to compensate for the increased phytic acid content of the higher extraction flour. When the rate of extraction was reduced to 85 per cent. the calcium carbonate addition was maintained at 14 oz. per sack. It has been hoped that the extraction rate would be reduced to 80 per cent. This lower extraction flour resulted in a lower output of bread, since the 85 per cent. flour took 1 gal. less water per sack than the 90 per cent. flour, thus making a difference of over two quartern loaves per sack. The dough has more cohesive and better gas-retaining properties. The dough has also better oven spring, and more care has to be taken with the final proof. The addition of the extra calcium carbonate was done on the advice of the Special Diets Advisory Committee of the Medical Research Council.

Divisional Inspection Panels

During the year the Ministry of Food set up Divisional Inspection Panels to help bakers who were having difficulty over the high extraction flour. A national bread survey is now being made each month to help bakers to keep up the quality of their bread.

Millers were instructed to include 35 per cent. home-grown wheat and 15 per cent. American wheat in their grists. The bad weather under which home-grown wheat was harvested resulted in a large quantity of unmillable wheat, and much of the wheat, although turned into flour, showed properties associated with partially germinated wheat, giving flour with a high maltose content. Such flours tend to produce runny doughs from the presence of enzymes and allied substances. This tendency had to be overcome by using a high proportion of salt in the doughs and other stabilisers in order to get loaves that would spring well and give good volume and crumb colour. A sponge and dough process was recommended to produce a slightly acid dough which helped to avoid stickiness in the loaves.

Flour Extraction Rate

Sir Jack Drummond, former scientific adviser to the Ministry of Food, recently predicted, in an address to the Food Education Society, that "we shall never return to the pre-war white flour." He based his prophecy on the theory that present flour extraction rate was a compromise between the highest possible nutritive value and the demands of popular taste. He appears to be convinced that 85 per cent. is the best extraction rate, since this flour contains a high natural vitamin B and iron content. There can be no reasonable or logical objection on the part of scientists or the Ministry of Food to the enrichment of flour by adding synthetic vitamins to flour, since the Ministry of Food, on the advice of its scientific advisers, has ordered the admixture of calcium to flour, this being a measure that has been considerably criticised.

So long as the U.S.A., Canadian and Australian flour exporters send white flour to this country of a lower extraction, which is now being mixed into home-milled flour, there is reason to believe that we shall eventually return to a whiter flour. While Sir Jack Drummond, and others of like mind, may honestly believe that a high extraction flour is best for the health of the nation, surely, when other nutrients are available in sufficient quantity, the public will again demand the type of bread that they like best.

The Confectionery Trade

The flour confectioner has been hard hit during the year by the 25 per cent. cut in fat and sugar early in May. Manufacturers were asked to arrange to reduce their output as soon as possible in order to save flour, but the net result was that many confectioners made cheaper mixings—using more flour to maintain their output. When bread rationing was introduced, the sale of flour confectionery was reduced by as much as 50 per cent. of normal for the first few weeks, and many bakers commenced to make better quality cakes and also produce cakes with under 15 per cent. flour which could be sold free of B.U.s. Wherever over 6¼ lb. confectionery products could be produced from 1 lb.

flour these contain under 15 per cent. flour and are free from the rationing Order. Such goods as best quality sponge sandwiches, Swiss rolls, and custard tarts fall into this class.

The prices of various raw materials have been increased during the past year: soya flour prices rose by about 3d. per lb., dried egg prices increased by 2s. 10d. per lb., and sugar-dried egg was increased to 5s. per lb. Frozen egg came back on to the market for some of the larger users at 1s. 7d. per lb.; fat and margarine prices have also been increased by 3d. per lb. Although the baking industry has been pressing the Ministry of Food for an increased basic selling price for products to cover increased costs, this has not been allowed yet, with the result that the flour confectioners are compelled through force of circumstances still further to reduce the quality of their products in order to maintain a working profit. It is strange that the Ministry of Food allowed an increased price of 2d. per lb. for biscuits but would not allow an increased price for flour confectionery, although at one time it did seem that a higher price would be allowed. It shows the necessity for having a good organisation and a good costing system which will be able to impress the Ministry of Food.

The sugar cut was restored to bakers in August, and the percentage of glucose allowed to bakers was increased to help them with the making of more fondant for cake decoration. The minimum oil and fat content of Christmas puddings was reduced from 10 per cent. to 9 per cent. to enable manufacturers to increase their production, which would otherwise have been severely restricted.

Allocation of Subsidiary Ingredients

The Ministry of Food announced in October that there would be an increased allocation of sugared and dried egg to enable manufacturers to produce iced and decorated cakes which could be sold during the four-week period ending January 4 at a ceiling price of 3s. 6d. per lb., or four times the cost price of the materials used, whichever was the lower. While there was no increased fat allocation, it made things difficult for those who wished to avail themselves of this concession of higher prices for Christmas cakes. No egg white or albumen was made available to bakers for the making of royal icing, although some was allocated to manufacturers of marshmallow and cream fillings and macaroon fillings. Fortunately there was a fair quantity of ground almonds and marzipan pastes available, and those who were able to get some could go ahead and make a few Christmas cakes, but the bulk supply was limited by the fat position. Some manufacturers required their customers to supply the fat and sugar for their cakes, and by doing this were enabled to make quite a number of Christmas cakes.

Sponge rolls and other sponge products covered with marzipan, sugar icing, or chocolate were all subject to the higher ceiling prices during this period, since they complied with the requirements of the Order. Now that this period of higher prices is over, and since the cost of fat and eggs and labour or manufacturing costs have risen considerably, it is high time that the ceiling price of 1s. 6d. per lb. was increased.

There are ground almonds, marzipan, marshmallow, cream fillings, peel, and cherries available which could be used to make more variety in confectionery if the industry could be sure of a reasonable profit on their products, but until the ceiling price is raised these raw materials cannot be used profitably by confectioners. Caterers can use them in making "fancies" to sell in their cafés, since they are allowed to charge a much higher price for cakes which are consumed on the premises. Some caterers are improving the quality of their products by using these materials, and by doing so are improving their sales and profits.

Research and Education

Research and education will play an important part in the future of the baking industry. The Baking Industries Research Association has now been established. A Director is soon to be appointed with a Council, and they, with the members, must ensure that the objects of this research association are successfully and efficiently carried out, the main ones being to improve the technical efficiency of the industry by the scientific investigation of the problems and difficulties met with in the course of business as well as by the application of new knowledge. This association should in due course lift the baking industry to a higher level than has yet been visualised. Manifold benefits should come to the industry as a whole and to the individual traders if this research association is fully backed by the baking industry.

Important plans for the future conduct of the industry are now being made and will come into operation as soon as some of the restrictions are lifted. A report on this subject by the Bread and Flour Industries Post-war Planning Committee issued last August is well worth studying by all who have the future of the industry at heart.

A National Advisory Committee on Technical Education was formed during the year and has been making a national survey of bakery trade education and planning new courses of instruction for promising and backward areas, and also implementing the National Diploma for bakery subjects.

The need for providing bakery workers with education of a character specially adapted to the requirements of the industry is now recognised by bakers all over the country, and the bakery organisations have been giving consideration to this subject. Plans are now being made for a country-wide extension of bakery education. The Committee recommends that bakery trade education should meet individual requirements by (1) employment in the industry, (2) by the development of craftsmanship with vocational training, (3) by technical education or the study of general principles underlying and applying to trade processes, (4) by giving free training during working hours, (5) by the promotion of schemes whereby those who can profit by taking higher courses can be assisted to attend them, and (6) by making the National Diploma and the City and Guilds of London full Technological Certificates continue to be the training qualifications recognised by the industry.

Much useful work has been done by the Baking Wages Councils through negotiations with the employers' organisations and the trade unions and by direct negotiation between employers and workers to improve the remuneration and conditions of work of all personnel in the baking industry, and in trying to make these the best the industry can provide.

By improved conditions and remuneration it is hoped to attract the best type of workers to the industry.

Bakery Schools

Many changes have taken place in the teaching staffs of the leading bakery schools during the past year. Mr. Bennion left the National Bakery School, London, to become a Technical Manager in the industry. Mr. Butterworth left the Leeds Bakery School to take up a Directorship of Industrial Research in Cheshire. Miss Chadwick of the Manchester Bakery School retired from her post, and Mr. Devlin of the Liverpool Bakery School resigned his appointment to become a technical bakery manager. The baking industry can afford to pay higher salaries than the educational authorities, so that there will usually be a tendency for the leading bakery technologists to drift from trade education into the industrial sphere.

There has been a greater number of students attending the schools this session than ever before and the type of student coming forward is much better than in previous years. Many of them are ex-service men who have had their ambitions aroused while in the Forces, and are now determined to become technically qualified to fill the higher positions of responsibility in the industry which attract men of initiative and personality.

Shark Fishing in Australia

SHARK fishing has become, since the war, a growing industry in Australia. At first glance it will seem a profitless occupation, but the sharks are providing Australia with a substitute for cod liver oil. Moreover, the concentrates got from sharks are five times as great as from cod liver oil. The shark's liver is the source of this valuable substance for which many uses are being found.

A big chemical industry in Australia has financed up to 100 small boats for this enterprise. The methods used for shark fishing in Australia are the long-line method, about 600 hooks to each line spaced at intervals along the cord and baited. The shark that provides the best livers in Australia is the Schnapper shark, and its flesh is readily saleable and palatable in the city fish markets, thereby bringing to fishermen two sources of income.

The shark livers are extracted from the shark and sealed in airtight tins for transportation to the works. The livers are then minced and put through huge metal boilers, or digesters, from which the oil is distilled. The finished product is five times more concentrated than the standard required by the British Pharmacopoeia. Vitamin A required for man's consumption goes through a different process known as winterisation, and involves filtering in a cooling chamber, which ensures that the vitamin content will not precipitate at a low temperature.

The vitamin contained in shark livers has been found of great benefit in the prevention and cure of cattle and other stock diseases. In order to build up the product when used for stock feed vitamin D_3 (extracted from sunshine by ray methods) is added to vitamin A, and the compound must then be soluble in water so that it can be fed to stock.

Vitamin deficiency affects stock in many ways, and, as an example, a disease in poultry, which is normally fatal, called coccidiosis, is now curable. The increase in egg production by fowls fed with vitamin A has been tested, and it was found without exception to be greater than when the poultry are fed on normal foods.

BOOKS RECEIVED

The Freezing Preservation of Foods. 2nd Edition. By Donald K. Tressler, Ph.D., and Clifford F. Evers, B.S.

Food and Drugs Administration. By Stewart Swift, M.B.E.

Small Goods Production. By Frank Gerrard, M.Inst.R., M.R.San.I.

The numbers on the eggshells from which these chicks have just been hatched indicate their parentage.

The Poultry Industry in Delaware

Research in agriculture and food at the Delaware Agricultural Experiment Station has grown steadily over the period of sixty years since its inception. Sussex County has a poultry industry which accounts for eighty-eight per cent. of its cash income, or about sixty-five million dollars, and the raising of broilers accounts for about twenty per cent. of the broiler income of the whole of the U.S.A.

WITHIN a radius of twenty miles of Georgetown, Delaware, is seen a broiler house of some description on every farm. These broiler houses vary in length from about 50 feet to almost an eighth of a mile. The size of the flocks varies accordingly. Some flocks consist of as high as 300,000 broilers (quickly grown chickens), located in several houses on a single farm.

It requires about fourteen weeks to "grow out" a batch of broilers. Allowing for about a week to get the broiler house in shape between batches, it is possible to raise several batches of broilers during a single year. Probably the average is three groups of broilers in the same houses during one year, therefore some poultrymen or broiler raisers have the capacity to produce over a million broilers in this period. The broiler, as grown in Delaware, weighs about 3 lb. when at the finished stage.

An abstract of a paper read before a joint meeting of the Food and Agricultural Group of the Society of Chemical Industry, by Mr. George L. Baker, Research Professor of Chemistry and assistant to the Director of the Delaware Agricultural Experiment Station, Newark, Delaware.

Hatching the Eggs

The hatching eggs are most frequently purchased from poultrymen in the New England States where the climate is cooler and unsuited for broiler production but is well adapted to growing of hardy stock. The flocks from which the eggs come are generally composed of New Hampshire hens crossed with Barred Plymouth Rock males. This produces a cross which gives the desired chunky type of broiler. The eggs are shipped by rail or motor vehicle from 300 miles to 700 miles into lower Delaware, where the big hatcheries (some with a capacity of two million eggs) are located. Some chickens are obtained direct from New England hatcheries, but the larger percentage are hatched in Delaware. Many of these are hatched on contract and delivered as day-old chicks.

The young chickens are brooded under coal stoves with surrounding hovers. The industry started out with small separate buildings, 16 feet by 16 feet, in order to prevent the spread of disease. In the first few years of the industry, growers expanded by simply building more of these small structures.

Broiler house at the University of Delaware Agricultural Experiment Station.

Long Brooder Houses

The first long brooder houses began to appear in 1928. These consist of a series of pens, about 16 feet by 16 feet, each housing approximately 1,000 chickens. Openings for feeding purposes are located toward the front of the pens. A wide board at the bottom of the open doorway prevents the young chickens from going from one pen to another. As they grow older they are able to hop over this board, which separates the pens, and sometimes will be found in a crowded condition at one end of the building, but this seldom occurs. A trolley truck is suspended from a mono-rail, which runs along the front of the house through these openings. This allows the transportation of food and supplies to the different pens. Water is piped to the birds, and automatic fountains are provided or a faucet is located in each pen for filling water fountains. The fronts of the brooder houses have large openings, which are generally covered with cloth obtained from that used in grain sacks. There are usually one or two glass windows to provide light when the cloth curtains are in place. Dirt floors are used in most instances. The kind of litter depends largely upon what is available, and in many cases is sawdust or ground corncobs. As the chickens grow to small broilers heat is no longer provided and more and more air is allowed to circulate through the houses. To assure good circulation of air an opening is provided at the back under the slanting roof.

The checking and weighing of individual eggs are carried out by means of the use of trap nests.

Treatment of Broilers

After fourteen weeks of growing under the above conditions the chickens are sold to buyers, who truck the broilers to killing plants or to the live-poultry markets of the large cities. Many broilers at the present time are received by killing and dressing stations in Sussex County. At these points the broilers are held in feeding batteries or conditioning cages for at least three days. Here they are fed special mashes, which are supposed to improve quality rather than increase weight. These holding cages also provide means of assuring a steady supply of broilers for killing.

In the killing and dressing operation the broilers are suspended by their legs from attachments to an overhead carrier. First, their throats are cut, the blood being allowed to collect in large receiving vats during transmission of the carcases to the point where they are hot-dipped for thirty seconds in order to loosen the feathers. The water in this bath is held at about 127° F.

Removal of Feathers

From this hot bath the carcases pass to a point in the production line where they are detached from the suspending arrangement and their feathers removed by mechanical pickers. When the majority of the feathers are removed the birds are returned to the overhead carrier. They then pass to a cooling bath, following which they are dipped momentarily into hot wax. The wax is allowed to cool in the air and is then removed by workers who simply break it from the chicken's body with their hands. This wax removes practically all the pin feathers. After a close inspection the broilers pass into a packing room where, after thoroughly cooling in ice, they are graded by several attendants and packed in barrels with ice for shipping to the city.

More and more killing plants are being equipped to cut up the broilers for deep freezing. The pieces are sometimes packed as a chicken unit, but frequently they are packed as legs, wings, breasts, etc., as the case may be, and quickly frozen. The packaging of these separate portions is gaining in popularity on the retail market.

Poultry Research

Poultry research in the State deals largely with breeds and breeding, feeding methods, production of better hatching eggs, and upon different particular problems associated with the broiler industry. This latter subject—that is, broilers—requires a special group of studies on feeding, types of management, and disease investigation.

Since the broiler industry is so important to the State the station has special studies under way towards the improvement of strains and breeds for the development of better meat types. It has studied the feeding of broilers with various types of special foods such as yeast-fermented oat products. The industry presents special problems, such as what types of litter to use and the method of handling litter during the period of broiler growth. Proper handling even of the litter may lower the incidence of disease. Frequently a low mortality rate means the difference between profit and loss on a batch of chickens. A survey of the diseases which most frequently were the cause of mortality has recently been made. Coccidiosis was found most important. This disease, bronchitis, omphalitis, and vitamin A deficiency were found to be the four leading causes of death and, collectively, were responsible for 75 per cent. of the mortality. Mortality in broilers is so serious that special studies have been started during the past two years upon coccidiosis and fowl typhoid, the latter disease being recognised as one which might become very serious in the concentrated broiler areas of the State. Caecal or bloody coccidiosis is characterised by severe haemorrhage in the caecal pouches of the intestines. When acute it causes sudden death.

Coccidiosis and Fowl Typhoid

One of the first studies of the causes of coccidiosis was on the effect of moisture of litters on the sporulation of coccidiae oocysts and upon methods of treating the litter in order to bring about favourable levels of moisture content. It is apparent from the studies that avian coccidia are sporulated over the wide range of moisture conditions (10 per cent. to 56 per cent.) examined, and little value has been found in aeration of the litter. Unsporulated coccidiae oocysts can exist in an undeveloped condition for long periods of time and then sporulate when favourable conditions appear. Studies have been made upon the value of feeding various sulphanilamide compounds, such as sulphamerazine, sulphathalidine, and sulphasuxidine. Under field conditions poultrymen have given encouraging reports on the use of sulphamerazine. In tests in the sub-station upon seven commercial-sized pens of 900 chicks each, it was found that sulphaguanidine, when fed intermittently every fifth day at the first sign of caecal coccidiosis, at a level of 1 per cent. in the feed, resulted in quite effective control of the disease after three feedings. This repeated dosage seems to be the most successful in the control of coccidiosis by medication.

Fowl typhoid experiments thus far have been restricted to methods of transmission. The disease has been rather mysterious in the manner in which it appears in certain flocks. Transmission by flies, rats, and even turkey buzzards has been investigated. This study is still proceeding.

Progress in Fruit Preservation

TWELVE years have passed since the first edition of a classic in its field* was published. In the intervening years the importance of fruit for the human dietary has increased to an amazing extent; fresh knowledge has been amassed in all the fruit-producing countries of the world; the importance of fruit as a source of vitamin C (and, in dried fruits, of other vitamins, too) has been appreciated, and the recent war afforded a unique opportunity both for putting into practice the knowledge already ascertained as well as providing a fillip for scientific investigations designed to elucidate still further the basic principles on which the practice of fruit preservation in all its aspects should firmly rest. This new edition of Mr. Morris's book is, consequently, published at the critical period when the fruit-producing countries of the world are turning their thoughts to the future and preparing plans to satisfy the enormous demands to provide stable forms of fruit with special reference to the off-season for fresh fruit in each particular country.

Candied Fruits and Fruit Juices

The second edition differs from the first in containing two completely new chapters on candied fruits and fruit juices, while several sections have been largely rewritten. The date of the author's preface (July, 1945) explains why he has been unable to make full use of all the advances made during the war, but it is obvious that the main trends of investigation have been sorted and included in his book.

The general outline of the monograph will be familiar to everyone connected with fruit preservation. The subjects of jams, jellies, fruit canning, and dried fruits are covered, with special emphasis on the underlying principles, although it could be wished that in some chapters much more attention had been given to the basic knowledge available, even at the expense of some of the details of practical manipulations which are given. It is difficult to criticise the book on the ground of any information that is given, nor, indeed, would one expect anything from Mr. Morris's pen to have been included without careful thought and the careful sifting of scientific evidence before its inclusion. Consequently, the new edition can be regarded as essential to any chemist or technician who is concerned with fruit preservation.

* *Principles of Fruit Preservation*. By T. N. Morris, M.A. 2nd Edition. Pp. xiii+198, with 36 figures. London. 1946. 18s. net.

Scientific Principles

On the other hand, a monograph on a clear-cut subject such as fruit preservation is expected to contain full information on scientific data which are likely to be called for in actual plant operation. It must be a matter of considerable difficulty to an author to determine just how far to go in including data which may not be closely concerned with any precise scientific principle, but in the case of the present book some chapters would have been of much greater value had they been expanded in various directions. For example, the first chapter deals with what must be a basic consideration for fruit processing, *i.e.* the composition of fruits. This is dealt with in three pages, with two pages of analyses, which, while they have been taken from the classic paper of Macara, are fifteen years old. The fruits dealt with are entirely of English origin, despite the fact that there has been a marked tendency in recent years for citrus and tropical fruits to be imported into this country for further processing into finished products. Data for these other types of fruits are readily accessible, and the chapter, to anyone with a catholic interest in fruits, seems incomplete. As far as acidity figures are concerned, Morris quotes a percentage for Worcester Pearmain which is 50 per cent. lower than the minimum figure given by Macara, and no mention whatever is made of the wide range of cider apples, which are characterised by their low acidity and high tannin content. The fruit pectin story has been considerably strengthened, but here again details of low sugar jellies and of other pectin derivatives are not adequately dealt with. These points should surely be considered as coming within the range of "principles."

Bottled Fruits

Again, it would appear that in the chapter on bottled fruits some reference should have been made, if only in passing, to the use of tablets of potassium metabisulphite, which achieved enormous success during the early war years for preservation of fruit in the home. In the chapter on fruit juices the author has given many practical details, but has only alluded in a few minor phrases to the principles which affect enzyme action and yeast inhibition. The reference to Pectinol being used in America and Filtragol in Europe is a little dated, as there is now a considerable use of the former product in Europe. One serious criticism deals with the various treatments of methods of

concentration of fruit juices. Considerable space and attention are given to the freezing methods of concentration at the expense of the much more important vacuum concentration procedure. The freezing method is undoubtedly destined to increase in importance, but at the moment the economics of the two processes (which are not mentioned) are important considerations which weigh against the cold method. It is a tribute, at any rate, to the increased importance of fruit juices to find the author setting apart a chapter for their special consideration.

Vitamins in Fruits

In view of the importance of vitamins in fruits, and the fact that at the moment a number of special fruit products are being used as vitamin supplements with guaranteed vitamin contents, the principles underlying the stability of vitamins, both during processing of fruit and in the final container, are of fundamental importance to the processors. Mr. Morris has attempted to cover the whole of this story for canned fruits, jams, fruit syrups and juices, frozen fruits, and dried fruits in the space of four pages. True, a considerable amount of information is contained in these pages, but it is suggested by the present reviewer that the importance of the subject matter of this chapter calls for extended treatment, and perhaps even for the whole chapter to be promoted in relation to the rest of the book. At the moment it has the appearance of a tail-piece. The considerations dealt with in this chapter are of primary importance to the majority of fruit processors, and should really be digested before the reader gets to grips with the specific processing details associated with any specific product.

Fruit Dehydration

In chapter XIII, the principles of dehydration are dealt with in considerable detail, and this section is to be recommended as a useful introduction to the practice of fruit drying. Mr. Morris has called very largely on American data, and has included formulae and much scientific material which are essential for an understanding of the specific problems which are peculiar to this process.

The editorial preface to the book sets out the author's terms of reference as "picking out the plums to save others from the indigestion that follows eating the whole pie." It can truly be said that Mr. Morris has done his work well in this connexion. The facts he has assembled are all plums, but it is humbly suggested that the few remaining fruits which he has left within the pie should be extracted and incorporated in the next edition when this is called for.—V. L. S. C.

Control of Abattoirs

A PLEA for reversion of public abattoirs from control of the Ministry of Food to that of local authorities was made by Professor Harold Burrow, M.R.C.V.S., of the Royal Veterinary College, speaking on "Future Control of Abattoirs and Knacker Yards" at a meeting of the Royal Sanitary Institute in London on December 11, 1946. He contended that State control had proved a failure during the war. It was often far from hygienic or even businesslike. The uniformity some claimed for it was a uniformity of mediocrity.

Local authorities, on the other hand, had a real interest in the health of citizens under their care. Their administrators were local men, accessible to the common man and vulnerable to criticism. Their local government officers were usually inspired by a healthy pride in their town and wanted to keep ahead of others. These factors, combined with the guidance and support which the Ministry of Health used to give before the war, could be relied upon to ensure clean meat.

Professor Burrow sought no relaxation of control as such. He declared that public and factory abattoirs should conform to the same regulations, and that all abattoirs and the meat from them should be under the supervision of a veterinary, a medical, and a sanitary officer working together as equals in a team. The medical man alone was fitted to decide whether workers were fit to handle meat. Only the veterinary officer had power to decide whether flesh was suitable for human consumption. It might not be feasible to have one veterinary officer to each abattoir, but one officer could supervise a group, delegating a limited responsibility to the sanitary officer.

Maintenance of Control

To ensure maintenance of adequate control and supervision and efficient collection and processing of by-products, Professor Burrow did not want to see the private abattoir, closed down during the war, reopened. It was time the Government released them for use as storage space, shop extensions, etc. He hoped butchers would accept reasonable compensation for them and not obstruct the movement towards a limited centralisation.

At the same time the butcher should be allowed to conduct his own slaughtering at the public abattoir. It would be a pity if the butcher lost his interest in slaughtering and became a mere "cutter-up." To many specialisation was repugnant and soul-destroying.

Professor Burrow declared that, "with few exceptions, knacker yards are a disgrace to those who own them and to local authorities who in-

spect them." They were frequently run by persons combining the business with such things as that of whippet dog breeding and the selling of "old iron."

Diseased animals were taken in and, all too frequently, sent out again. The colouring of carcases did not always prevent their sale as human food. No death certificate was insisted upon and only a small proportion of animals were examined *post mortem*. As a result disease was often not detected and the owner of the animal was left in ignorance of a danger that might affect his other stock.

Knacker yards were crying out for public control. It was suggested that their name should be changed to "animal disposal stations." They should be under control of a veterinary surgeon responsible to the local authority. Incinerators capable of dealing with the largest animals should be installed. By-products should be collected and processed where it was safe to do so. Every dead animal should be examined *post mortem* and a report sent to its owner.

The Professor's criticisms drew a decidedly favourable response from his audience. One speaker stressed the dangers of selling diseased meat as dog food to housewives, who had to handle human food as well. Another objected that some of the people in queues outside knacker yards were not only dog owners, but also boarding-house keepers!

All were agreed on the necessity for reports to farmers, not only on animals sent to knacker yards but on carcases condemned at the abattoir. By co-operation between the veterinary or sanitary officer and the farmer it was held that much disease could be prevented. Farmers were now more willing to accept advice than they were thirty or forty years ago.

Other speakers had stressed the need for more *ante mortem* inspection; in Argentina such inspection of all animals was made as a routine measure, especially with a view to detecting anthrax and tuberculosis.

Conserving Mushrooms

A NEW process for conserving mushrooms has recently been described in *La Nature*. Originally it was attempted to dehydrate them in a vacuum, but it was found that, owing to their high water content, the residue was only one-tenth the weight of a fresh mushroom, and was unrecognisable. By means of an additional operation mushrooms can now be dehydrated in a vacuum without altering their shape, and without appreciable contraction of the dry residue.

This result is obtained by stiffening the mushrooms by freezing and maintaining the temperature below 0° C. while the dehydration is taking place in the vacuum. The mushrooms are prepared by first freezing them as quickly as possible in a metal container surrounded by a mixture of ice and calcium chloride, at a temperature of −20° C. When frozen, the mushrooms are placed in a glass desiccator containing dry calcium chloride. The apparatus itself is re-frozen to avoid a possible de-freezing during the manipulations. The vacuum is then produced with a vane type pump, giving a pressure of less than one millimetre of mercury. Finally, the desiccator is placed in a cold room with a temperature of −10° C.

Desiccation is completed in 8 days, and in spite of a mild contraction the mushroom's form and colour are well conserved and easily recognised.

It is not yet possible to say that all species of mushrooms will react in this way, but as far as the *Ascomycetes* are concerned, results have been excellent.

Studies in Refrigeration

A COMPREHENSIVE educational study of the engineering physics and biology of refrigeration, this volume* will be particularly useful to readers interested in the sale or servicing of refrigerators and to those on the practical side who wish to improve their efficiency by acquiring a deeper knowledge of theory. There are twenty-seven original illustrations and some valuable tables.

The principles of refrigeration are dealt with in a clear, logical, and concise manner; early chapters deal with heat and its measurement, latent heat, and the three basic laws governing the production of refrigeration.

Features of a good refrigerant, the measuring of evaporator capacity, with an explanation of evaporator and condenser functions and capacities, are clearly outlined. Main types of machines are considered and compared with a lucidity that induces a clear understanding.

Compound and booster compression systems, together with multiple-effect compression, are described fully, as are heat flow, direct expansion, flooded systems, and forced air circulation.

Some discussions of early methods are used for purposes of comparison, and insulation and heat leakage factors are dealt with at some length and to good purpose. Design and specification, humidity, air conditioning, action of bacteria, nutritive values and flavour, and slow freezing are subjects agreeably presented to the reader. The volume comprises a valuable contribution to electrical refrigeration literature.—B. Q.

* *Refrigeration Educational Course*. Pp. 76. London. 10s. net.

New Method for Determining Spoilage in Foodstuffs

General view of the apparatus for measuring spoilage in foodstuffs.

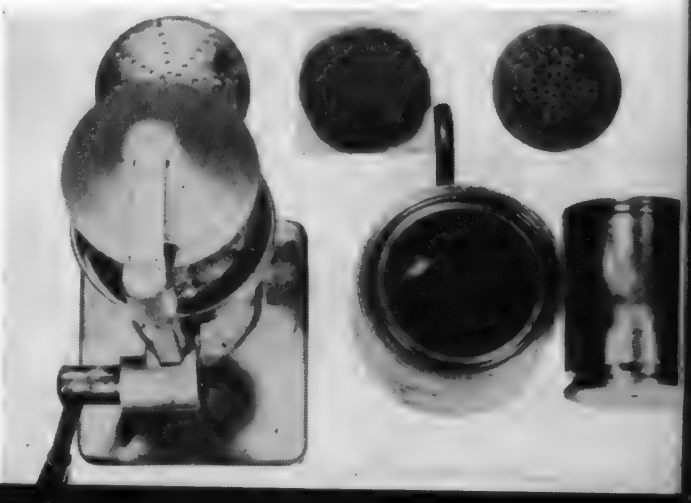
Aeration flask, reduction vessel, and air-inlet tube which form part of the apparatus.

THREE research workers of the George Williams Hooper Foundation for Medical Research, University of California, have carried out research work in methods of measuring spoilage in fish.

Based on the determination by an aeration technique of volatile reducing substances, a method was worked out for the estimation of spoilage in which was used an instrument called a "Stinkometer," which evaluates quantitatively losses and gains of odour. Values for Californian sardines, mackerel, and tuna at various stages of spoilage have been examined and further applications of this procedure are being investigated.

A current of purified air is passed through an oxidising reagent after it has abstracted the volatile odoriferous substances from the sample.

It is hoped that this procedure may also be applied to foodstuffs other than fish, such as prunes, meats, raisins, spices, and coffee.



A hand juice press (left) and other implements used for measuring food spoilage.

Ministry of Food

Latest Statutory Rules and Orders

The list given below is the continuation of the list of Orders published in *Food Manufacture*, December 1, 1946, page 516.

No.	*Date.* 1946.	PRICE FIXATION ORDERS
1477	Sept. 3.	Order amending the Biscuits (Maximum Retail Prices) Order, 1943. (Sales by weight; Broken biscuits.)
1478	,, 2.	Fish Sales (Charges) (Amendment) Order. [Emergency Powers (Defence) Act, 1939, s.2; Supplies and Services (Transitional Powers) Act, 1945, s.5.] (Pilchards, sprats.)
1485	,, 4.	Order amending the Preserves Order, 1944. (Prices; Blackberry, blackberry and apple, bilberry jam.) Revokes S.R. & O. 1945 No. 1449; 1946 No. 1222.
1513	,, 12.	Order amending the Tomatoes Order, 1946. (Prices.)
1515	,, 12.	Order amending the Dried Fruits (Control and Maximum Prices) Order, 1943. (African dates.)
1528	,, 16.	Order amending the Canned Puddings (Maximum Prices) Order, 1945. (Sweet puddings prices; Christmas puddings.)
1542	,, 19.	Order amending the Meat Products, Canned Soup, and Canned Meat (Control and Maximum Prices) Order, 1946. (Prices; Pork and soya links.)
1545	,, 23.	Order amending the Cheese (Control and Maximum Prices) Order, 1943. (Camembert, imported blue vein, and specified cheese.)
1565	,, 27.	Order amending the Macaroni and similar Products (Control and Maximum Prices) Order, 1942. (Prices, containers.)
1583	,, 28.	Order revoking the Leeks (Maximum Prices) Order, 1943. Revokes S.R. & O. 1943 Nos. 1134, 1762; 1946 No. 1214; and, as respects Leeks only, 1946 No. 248.
1589	,, 30.	Order amending the Wheat (Control and Prices) (Great Britain) Order, 1945, and the Wheat (Control and Prices) (Northern Ireland) Order, 1945. (October, 1946, prices.)
		CANNED FOOD
1724	Oct. 25.	Canned Fruit and Vegetables (No. 2) Order. Revokes S.R. & O. 1946 Nos. 278, 708, 1078.
		FEEDING STUFFS
1610	Oct. 3.	Order amending the Feeding Stuffs (National Priority Pigeon Mixture) Order, 1943.
1716	,, 22.	Order amending the Feeding Stuffs (Regulation of Manufacture) Order, 1944.
		FISH
1669	Oct. 11.	Fish Sales (Charges) (Amendment) (No. 2) Order. [Emergency Powers (Defence) Act, 1939, s.2; Supplies and Services (Transitional Powers) Act, 1945, s.5] (White fish, mackerel.)
		MANUFACTURED FOODS
†1486	Sept. 4.	Order amending the Manufactured and Pre-Packed Foods (Control) Order, 1942. (Fresh fruit and vegetables.)
		† Printed with S.R. & O. 1946 No. 1487.
		MEAT
1519	Sept. 13.	General Licence. (London area delayed deliveries.)
		NUTS
1514	Sept. 12.	Order amending the Nuts Order, 1945.
		POINTS RATIONING
1631	Oct. 8.	Order amending the Rationing (Personal Points) Order, 1946. (Seamen's rations; Increase to 16 points ration; Weight equivalents of prepacked goods.)
1644	,, 10.	Order amending the Food (Points Rationing) Order, 1946. (Dates, sausages, Irish stew, values; Canned Christmas puddings, apples, exemption; Blue vein cheese.)
		VEGETABLES
1689	Oct. 16.	Order revoking the Green Vegetables Order, 1945, and the Imported Green Vegetables Order, 1946. Revokes S.R. & O. 1945 No. 1169, and, as respects green vegetables only, 1946 No. 248.

The Vitamins

Progress in 1946

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This article continues the survey of progress in vitamin research reported by the same author in FOOD MANUFACTURE, March, 1946.

THE results of scientific research occasionally outstrip the objects envisaged when the research was first begun, and a striking illustration of this has been provided during the year under review by the story of folic acid, which is briefly recounted below. Starting in the first place as a rather academic investigation into the nutritional requirements of certain bacteria on the one hand, and of chicks on the other, the results recently reported suggest that folic acid may be an important therapeutic agent for the treatment of several different forms of anaemia, and a plausible explanation of its anti-anaemic effect has been put forward. Of equal importance is the claim—made by three independent groups of workers—to have synthesised vitamin A, which has defeated the skill of chemists for so long. Beside these dramatic developments, the additions to knowledge in other fields have been relatively small, but important advances have been made in our knowledge of the functions of pyridoxine and its relatives, mentioned in last year's report,[1] while a close connexion has been shown to exist between certain essential amino acids. A large amount of additional information has been accumulated during the year concerning the importance in animals and man of bacterial synthesis in the intestine, referred to in the 1945 survey.

Vitamin Assays

Considerably fewer papers dealing with methods of assay have been published in 1946 than in the previous year, and it would appear that existing methods of estimation are now fairly adequate for most purposes. Indeed, such papers as have appeared generally relate to slight improvements in existing methods or to modifications designed to meet special requirements. For example, the new reagent glycerol-1:3-dichlorohydrin, for estimating vitamin A or vitamin D, has been improved[2] by preliminary activation by distillation with antimony trichloride under reduced pressure, while special methods have been developed for the estimation of vitamin A in liver[3] and in dried egg;[4] these eliminate interference from other highly unsaturated substances. Again, an improved medium for the microbiological assay of six of the B vitamins has been devised,[5] and this should considerably simplify the task of carrying out a complete estimation of the vitamin B content of a foodstuff; the alternative method is to prepare a special medium for each vitamin, and this is of course time-consuming. An improved method of assaying biological materials microbiologically for pantothenic acid has been described,[6] in which the material is first digested with an enzyme preparation, "mylase P." This breaks down the material satisfactorily without either destroying the vitamin, as do acids and alkalis, or introducing additional pantothenic acid, as do most other enzyme preparations. An attempt has been made[7] to establish the validity of the microbiological assay method when applied to materials that may contain hitherto unrecognised growth factors, namely, yeast and liver extracts, by using two different, and generally unrelated, micro-organisms for the estimation of each vitamin. In general, the results were in fairly close agreement. A critical study has been made[8] of the biological assay of vitamin D_3 by means of chicks, using three criteria of response. A method has been recommended for routine assays that gives good results and requires no special apparatus.

Vitamins in Foodstuffs

Surprisingly few papers have been published concerning the vitamin contents of foodstuffs, though some attempts have been made to estimate the newer vitamins such as biotin and folic acid; the significance of the results is in some doubt, however, in view of the probability that these vitamins are normally derived from the intestinal flora. Two papers on the vitamin C content of milk have appeared,[9,10] in which the amount present in raw milk is reported as 1·34 mg. and 1·71 mg. per 100 ml. respectively. Pasteurisation seriously reduces the amount, the values recorded for pasteurised milk being 0·69 mg. and 0·58 mg. per 100 ml. respectively. In the second paper the corresponding values for reconstituted evaporated milk and fresh powdered whole milk are given as 0·2 mg. and 1·25 mg. per 100 ml.

Fat-Soluble Vitamins

A revival of interest has taken place in vitamin A and its various provitamins. It has been found that[11] the amount of growth produced by β-carotene or vitamin A varies with the nature of the diet and with the amount of vitamin fed. The average value of the factor required to convert extinction coefficients into international units was found to be 1,700, but with high daily doses the value was as low as 1,000, and with low daily doses as high as 3,600. In view of the doubt concerning the biological equivalence of vitamin A and β-carotene, the use of a form of crystalline vitamin A as a biological standard in place of β-carotene is advocated. Other workers[12] have demonstrated that the biological value of β-carotene is different in, for example, carrot and spinach, and that 1 mg. of pure carotene is equivalent to 0·8 to 2·4 (average 1·4) U.S.P. units of vitamin A. On the other hand, the vitamin A potency of dehydrated vegetables can be estimated satisfactorily by colorimetric estimation of the carotene.[13]

Vitamin A_2 is a substance closely related to vitamin A that occurs in the retina of fresh-water fish. It has now been shown[14] that vitamin A_2 is incorporated into the visual purple of the rat, following administration of this substance; although the blood content of vitamin A_2 increases, the normal vitamin A content is not thereby reduced.

Synthetic Vitamin A

Claims to have synthesised vitamin A or its derivatives have been made from time to time, but have never been substantiated, and with each succeeding claim the degree of scepticism tends to increase. Further claims have now been made from three separate laboratories, and it appears that this baffling problem has at last been solved. One, perhaps, should add that it does not necessarily follow that synthetic vitamin A may soon—or ever—become an article of commerce. J. F. Arens and D. A. van Dorp,[15] working in Holland, describe the synthesis of the acid corresponding to vitamin A and state that it has one-tenth the activity of vitamin A when administered in oil solution, and the same activity when given in the form of an aqueous solution of its sodium salt. Administration of the acid did not, however, result in storage of the vitamin in the liver. N. A. Milas,[16] working in the U.S.A., claims to have synthesised a number of biologically active ethers and esters of vitamin A and has protected the processes in a series of patents. The synthetic products appear to be mixtures of *cis* and *trans* isomers. Finally a group of Swiss workers[17] claim to have synthesised the methyl ether of vitamin A, but do not report its biological activity. Other workers[18] have described methods for the preparation of ethers of vitamin A from natural vitamin A alcohol or ester; these have biological activities ranging from 3 million to 4·8 million U.S.P. units per g. Interest in the biological activity of the carotenoids continues, and two further provitamins A have been reported, namely, torularhodin,[19] the methyl ester of which has one-fifteenth to one-twenty-fifth the activity of β-carotene, and neocryptoxanthin A[20] with 42 per cent. of the activity of β-carotene. ζ-Carotene was inactive.[21]

Less interest has been displayed in vitamin D than in vitamin A. D. Krestin[22] showed that a single massive dose of calciferol (300,000 I.U.) prevented rickets in children as effectively as did a number of small doses, but that small doses were more effective in the treatment of the disease. The incidence of rickets in children decreased with age. A daily dose of 1,500 I.U. of vitamin D in the form of the Ministry of Food cod liver oil compound protected most infants under six months old, and 2,100 I.U. protected all; 300 I.U. per day protected children aged one to two years. Infants under one year of age with mild rickets were cured by 1,500 I.U. and children one to three years old by 3,000 I.U. Vitamin D was efficiently absorbed by women from fish liver oils, but a large proportion was rapidly destroyed.[23] Only a small proportion was secreted in the milk, and to enrich the milk effectively the vitamin must be given immediately prior to or during lactation.

The only interest in vitamin E has been in its ability to delay the oxidation of linoleic acid and thus indirectly to protect carotene.[24] The keeping quality of processed hog fat is said to be dependent on its tocophenol content, this being the only natural inhibitor present; it is derived solely from the diet of the pig.[25]

Vitamin B Complex

In a recent review,[26] the author suggested that the association of specific deficiency diseases with certain members of the vitamin B complex, and the absence of any such association with other members, might be explained by supposing that the aneurin, riboflavin, and nicotinic acid requirements of man are normally derived from the diet, whereas the necessary pyridoxine, pantothenic acid, biotin, *p*-aminobenzoic acid, and folic acid can be, and often are, supplied by micro-organisms growing in the intestinal tract. This hypothesis appears to receive some support from the work of C. W. Denko *et al.*,[27] who found that the total daily urinary and faecal excretion of *p*-aminobenzoic acid, folic acid, pantothenic acid, and biotin was greater than the dietary intake, whereas the total excretion of aneurin, riboflavin, pyridoxine, and nicotinic acid was less than the dietary intake.

Nicotinic Acid and Riboflavin

It is clear, however, from other work that the distinction between the two groups is not a sharp one, and that some of the members of the last group may be synthesised in significant amounts by intestinal bacteria. Attempts are now being made to determine the conditions under which intestinal synthesis may take place. Thus it has been shown[28] that rats on a high protein-high fat diet require twice as much riboflavin as rats on a normal diet, while rats on a low fat diet require only half as much; the difference is attributed to a difference in the amount of riboflavin synthesised by micro-organisms in the intestine on the two diets. Again, aneurin depletion can be produced[29] in human subjects on a diet rich in aneurin by supplementing the diet with viable fresh bakers' yeast.

What may well be another example of the same phenomenon was reported by W. A. Krehl *et al.*,[30] who found that the addition of maize to a diet low in nicotinic acid leads to a nicotinic acid-deficient state, which can be cured by the use of a carbohydrate that produces a satisfactory intestinal flora or by administration of nicotinic acid or tryptophan. Similarly G. M. Briggs[31] and F. Rosen *et al.*[32] observed a drop in nicotinic acid excretion when casein was replaced by gelatine, which is a tryptophan-deficient protein; on giving this amino acid, large amounts of nicotinic acid were immediately excreted in the urine. D. W. Woolley[33] and H. Spector and H. H. Mitchell,[34] however, believe that the pellagra-promoting properties of maize are not due to interference with the intestinal flora. Woolley suggested that maize contains an antagonist for nicotinic acid, and showed that 3-acetyl pyridine inhibits the growth of rats. C. Kodicek *et al.*[35] showed that indole-3-acetic acid, which is present in maize in considerable amounts, has a similar effect. Both compounds are antagonised by nicotinic acid or tryptophan. Thus a predominantly maize diet may predispose to pellagra either because of the presence therein of a substance antagonistic to nicotinic acid or because it reduces the growth-rate of intestinal micro-organisms that synthesise nicotinic acid. It is at present impossible to say which of these two hypotheses is correct or whether indeed both are correct. The attempts to discover the reason for the peculiar effects of a maize diet on rats have, however, revealed an interesting connexion between nicotinic acid and tryptophan, although it is not yet clear whether tryptophan in some way improves nicotinic acid synthesis or whether it is an actual precursor of tryptophan.

A number of substances have been reported that antagonise the growth-stimulating properties of riboflavin for micro-organisms. These include galactoflavin,[36] araboflavin,[37] lumiflavin,[38] and a large number of antimalarials, including Mepacrine. Indeed, J. Madinaveitia[39] used this property to assist his chemical colleagues in elaborating new antimalarials, although, oddly enough, Paludrine, the most promising of them all, is exceptional in not antagonising riboflavin, thus proving that anti-riboflavin activity does not coincide with antimalarial activity.

Pyridoxine, Pantothenic Acid, and *p*-Aminobenzoic Acid

The triple function of pyridoxine and the closely related substances, pyridoxal and pyridoxamine, were described in last year's report.[3] In view of the differences in the biological activities of these three substances, a method of estimating each of them in a mixture is obviously desirable. Such a method has now been described by D. Melnick and his colleagues,[40] although unfortunately it is not applicable to all types of biological material. The method depends on the fact that *Saccharomyces carlsbergensis* responds to all three substances, *Lactobacillus helveticus* to pyridoxal only, and *Streptococcus faecalis* to pyridoxal and pyridoxamine, but not to pyridoxine. Pyridoxine and its derivatives provide another illustration of the probable importance of intestinal bacterial synthesis in nutrition. It has been shown[41] that rats on a sucrose-blood fibrin diet low in vitamin B_6 fail to grow, but that growth is restored when the sucrose is replaced by dextrin; this apparently leads to a more active synthesis by the intestinal bacteria of pyridoxine, which is then utilised by the rat. Clearly a large amount of work is required in order to establish the precise conditions required to promote bacterial synthesis and to determine the amount of each vitamin that can be made available to the host from this source.

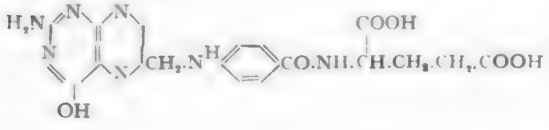
The relationship between nicotinic acid, tryptophan, and 3-acetylpyridine has already been noted. A similar relationship appears to exist[42] between pantothenic acid, phenyl pantothenone, and histidine or glutamic acid, and between *p*-aminobenzoic acid, sulphanilamide, and methionine. It can hardly be a coincidence that the growth-promoting properties of these three members of the vitamin B complex are simulated by different amino acids, and it has been suggested that *p*-aminobenzoic acid takes part in the synthesis of methionine.[43] H. McIlwain[44] has continued his investigations into the metabolism and function of members of the vitamin B complex in bacterial growth, and he has shown that the bacteriostatic actions of pantoyl taurine and sulphanilamide are due to their ability to inhibit the uptake of pantothenic acid and *p*-aminobenzoic acid respectively by micro-organisms. Pantothenic acid is apparently necessary for normal reproduction,[45] as a deficiency

of this factor instituted one to twenty-three days before mating resulted in a failure of implantation or in resorption or defective litters.

Biotin and Folic Acid

A large amount of work has been carried out during 1946 on substances related to biotin, particularly the compound obtained by removing the sulphur atom from biotin and the compound obtained by replacing it with an oxygen atom. As stated in last year's report, both stimulate the growth of various micro-organisms, though not to the same extent. Moreover, the latter—known as oxybiotin or O-heterobiotin—combines, like biotin itself, with avidin, whereas desthiobiotin does not.[46] Oxybiotin appears to be active *per se* and not by conversion into biotin.[47] Desthiobiotin, although a growth factor for some micro-organisms, inhibits the growth of others.[46, 48] Conclusive proof has been obtained that biotin is synthesised by humans,[49] the total biotin output being nine, three, and one and a half times the intake on diets containing small, moderate, and large amounts of biotin respectively.

Until this year, considerable confusion existed concerning the relationship of the growth factors known as folic acid, the norit eluate factor (subsequently termed the *L. casei* factor), the SLR factor, vitamin B_c and vitamin M, if indeed the factors were related to one another at all. The picture was further confused by the subsequent recognition that the *L. casei* factor and vitamin B_c occurred in some natural substances in conjugated form. All these factors resembled one another in being isolated from materials containing them by adsorption on charcoal or similar adsorbent, followed by elution with a weak base such as ammonia, and in stimulating the growth of certain micro-organisms, particularly *Lactobacillus casei* (called in this country *L. helveticus*) and *Streptococcus lactis* R (*S. faecalis* R). Vitamin B_c, however, was first recognised as a factor that cured an anaemia in chicks, although later it was shown to be a growth factor for micro-organisms, while the *L. casei* factor was shown to be effective on chicks. An announcement that the *L. casei* factor had been synthesised was made early in 1945,[50] but the chemical constitution and mode of synthesis were not disclosed until this year. It has now been reported[51] that the *L. casei* factor from liver consists of a substituted pteridine molecule linked through *p*-aminobenzoic acid to a glutamic molecule:



A similar factor prepared by fermentation contained three molecules of glutamic acid apparently linked together to form a peptide chain, while a compound similar in biological properties to the SLR factor contained no glutamic acid. It is proposed to call this last compound pteroic acid, and the liver *L. casei* factor pteroyl glutamic acid. The fermentation product then becomes pteroyldiglutamyl-glutamic acid and yeast vitamin B_c conjugate, which contains seven molecules of glutamic acid,[52] becomes pteroyl hexaglutamyl glutamic acid. This last-named compound, in contrast to the factor with only three glutamic acid molecules, had no microbiological activity. It became active, however, on digestion with the enzyme known as vitamin B_c conjugase, which is therefore a member of the group of peptidases. It is probable that a series of pteroyl glutamic acids exists containing a variable number of glutamic acid residues; this would account for the similar, though not identical, behaviour of the various members of this group, which might conveniently be referred to as the folic acid complex.

It has been shown[53] that competitive inhibition occurs between sulphonamides and *p*-aminobenzoyl glutamic acid, but not between sulphonamides and pteroyl glutamic acid, and it has therefore been suggested that sulphonamides may exert their bacteriostatic activity by preventing the conversion of *p*-aminobenzoyl glutamic acid into pteroyl glutamic acid. The isolation from yeast of *p*-aminobenzoic acid in combination with ten or eleven molecules of glutamic acid has been reported[54] and is of considerable interest in relation to the structure attributed to folic acid.

Synthetic Folic Acid

Of far greater practical importance are the reports[55] that synthetic folic acid (*L. casei* factor) has been used successfully in the treatment of pernicious anaemia, tropical macrocytic anaemia, and sprue. A. D. Welch *et al.*[56] observed that folic acid (pteroyl glutamic acid) was not liberated from the conjugate present in yeast (pteroyl hexaglutamyl glutamic acid) by incubation with normal gastric juice, nor did it produce a response in a pernicious anaemia patient when given orally, with or without normal gastric juice, or by injection. Folic acid itself, however, was effective both orally and by injection. A normal subject, but not a patient with pernicious anaemia, excreted free folic acid following intramuscular injection of the conjugate, and Welch *et al.* therefore suggest that pernicious anaemia patients fail to utilise the conjugate present in their diet and from which the folic acid required for reticulocytosis is normally derived. The liver extracts commonly employed in the treat-

ment of this condition probably contain a component of the conjugase system necessary for the breakdown of the conjugate or else a substance which counteracts inhibitors of conjugase activity.

The year 1946 has therefore been an important one in the history of vitamins, and, although the emphasis has shifted during the past year or two from one group to another, there is no sign of any decline in the interest shown by research workers in the vitamin field. Indeed, it can safely be predicted that the chemical and biological properties of the folic acid complex will be even more intensively investigated during the coming months in the hope that still further light will be thrown on the role it plays in the economy of animals and micro-organisms.

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Frozen Fruit Stock for Jam

ALL commercial jam manufacturers find it necessary to store stocks of fruit so that jam making can proceed out of the fruit season. The most widely used method in this country is to store fruit pulp preserved with a high concentration of sulphur dioxide. In a comparative study with peaches and strawberries, however, H. H. Thompson *et al.* (*Food Ind.*, 1946, **18**, p. 1341), have found that jams made from frozen fruit stock are superior in colour and flavour to those made from sulphited stock. Canning was also found satisfactory for preserving fruit stock. Refrigerating the finished jam also gave better colour retention than storage at room temperature.

All these procedures would necessarily involve additional expense as opposed to simple sulphiting, but this might be justifiable for the production of high quality jams, especially in warm climates.

CORRESPONDENCE

Free Trade

TO THE EDITOR OF FOOD MANUFACTURE

DEAR SIR,—In your interesting leading note on the Corn Law Centenary (December issue, p. 506) there are references to Free Trade, such as "we became a Free Trade country," the "Free Trade Union," and "the clarion call of the Free Trader." It would appear, therefore, that there may be quite a few people who are still pleased to call themselves free traders; and I would like once again—as I did years ago when the issue of Protection *v.* Free Trade was much more lively than now—to enquire what exactly is meant by this sonorous and much-abused term? It is a matter of the utmost importance to have clear ideas on the subject from a national food point of view.

As I understand it, Trade means both exports and imports, especially exports, but the free traders (so called) seem to forget entirely the export side and look only at imports. As a matter of fact, this so-called free trade in the past has, in practice, invariably meant free imports with all the attendant curses of dumped goods. Our export trade, on the other hand, has been fettered, strangled, chained, and restricted by heavy import duties in other countries, and by no stretch of the imagination could be described as free. If then the export side is so fettered, how can our trade be called free? It may be added that the conditions as to exports of our manufactured goods and imports of food and raw material were vastly different at the time of the Corn Laws repeal and immediately thereafter from what they are now or have been for the past fifty years.

Adam Smith himself, in his *Wealth of Nations* (1776), on which Peel is said to have based his advocacy of Corn Law repeal, describes the real genuine free trade (and not the false, one-sided, spurious sort) as being free in all respects, as much on the export as on the import side, and insisted that it must be mutual or reciprocal. He would no doubt have been among the first to repudiate the ridiculous one-sided and philanthropic policy subsequently adopted in this country. It was adopted in the fond hope (or shall we say child-like faith?) that other countries would follow our example and also adopt free trade. But they didn't. Why should they? Britain had very kindly and most generously opened the doors of her own home markets as widely as possible, and invited all and sundry to dump their cheap goods on the British doorstep without let or hindrance. Once again Britain's blind faith in the good nature of other countries had been misplaced.

The best way to achieve the real genuine free trade is by having tariffs ourselves on imports; then and then only are we in a position to negotiate terms of mutual free trade or reduced tariffs with other countries by collateral agreements, trade treaties, etc., as we have been doing since tariff reform was introduced none too soon. But by throwing away our only bargaining weapon and allowing unrestricted free imports we lose even this opportunity of making some approach to world-wide truly reciprocal free trade, to say nothing of loss of revenue.

Under the present abnormal conditions, when many countries would be only too pleased to take any exports we have to spare and we should be delighted to have all the imports we can get, the foregoing statements appear unreal or belong to another world; but if and when international trade and competition revive, then it may be well, perhaps, to bear in mind what free trade really means.

Yours faithfully,
W. G. CASS.

Princes Risborough.

Calendars and Diaries

THANKS to British Celanese for a handsome desk diary; a desk pad from Rex Campbell and Co.; a spirally bound desk diary from the United Steel Co., Ltd.; and useful day-to-a-page desk pads from Pearlite Box Co., White Sea and Baltic Co., and P. and I. Danischewsky, Ltd.

Excellently produced book diaries from W. A. Mitchell and Smith, Manchester Oil Refinery, British Vegetable Parchment Mills, and I.C.I. Desk calendars from Geo. W. Pickles and Co., and Edme, Ltd. Wall calendars from Silkells, the British Vacuum Cleaner and Engineering Co., the Crack Pulverising Mills, M. Hamburger and Sons, British Insulated Callender's Cables, Watts, Geo. W. Rhodes and Sons, and a particularly beautiful one from William Smith and Sons, of Toronto, and also one from CIBA depicting reproductions of earlier English paintings relating to medicine and hygiene.

Calendars were received from Neill and Co.; Nuneaton Newspapers; Wightman and Co., Ltd.; Spooners; Ormerods, Ltd.; Sydney Smith (Industries), Ltd.; the Press at Coombelands; Boxfoldia, Ltd.; H. Shaw; and a diary from Dunn's successors.

The large number of Christmas cards were welcomed and are gratefully acknowledged, but paper rationing unfortunately precludes mention by name of all those who have so honoured us. They came from readers, advertisers, and particularly due for mention are those from old members of the staff now working elsewhere, and from many places abroad.

The Foden tractor-type vehicle hauling a low-loading, quick - detachable articulated trailer body ; two of these trailer units are used in conjunction with the one tractor unit.

Road Transport of Food

Progress in 1946

H. SCOTT HALL, M.I.A.E., M.I.R.T.E.

A review of the progress made by manufacturers of vehicles suitable for food transport and reference to new or improved models which have appeared during the past year.

THOSE with a full appreciation of the difficulties which manufacturers of motor vehicles of all kinds have had to meet during 1946 will undoubtedly feel that they must congratulate the producers of commercial motor vehicles at any rate upon the progress they have made in spite of the obstacles they have had to surmount. There may not have been any striking departures from previous practice, but there is evidence in the number of new models that have appeared of a positive determination to keep users supplied with the latest and best in the way of road transport machines.

First comes the Dennis 12 ton rigid six-wheeled oiler, introduced just too late for reference in the previous annual review. The makers have given this new model the name of Jubilant, one which seems appropriate, having in mind the fact that it was produced so soon after the cessation of hostilities.

The power unit of this new machine is a six-cylinder direct-injection oil engine of Dennis make. The bore and stroke is 105 mm. and 146 mm. respectively, giving a swept cylinder volume of 7·58 litres. It develops 100 b.h.p. at the governed speed of 1,800 r.p.m., and the maximum torque is 335 lb./ft. at 1,100 r.p.m.

Both rear axles are power driven by overhead type worm gear, and the standard rear axle reduction is 8·25 to 1.

Particular attention appears to have been paid to the brake gear. The brakes themselves are the Girling two leading shoe type. They are hydraulically operated through the medium of a vacuum servo. The tyres fitted are 36 in. by 8 in. high pressure all round—that is to say, twin tyres on all four rear wheels and single tyres on the front.

New Design for Delivery Van

The Morris Commercial 15/20 cwt. delivery van has a four-cylindered petrol engine of 80 mm. bore and 102 mm. stroke and develops 42 b.h.p. at 3,250 r.p.m. The suspension is by semi-elliptic springs on front and rear axles with hydraulic shock absorbers on the front as auxiliaries. One or two important aspects of the completed vehicle are to be noted in respect of the body work. First of all as to the rear doors, the swing of which is controlled so that when wide open they barely exceed the width of the van, thus eliminating the risk of accident so likely to happen when rear doors are allowed to swing wide open and thus get in the way either of passing vehicles or pedestrians on the pavement.

Even more interesting is the design of the doors to the driver's cab, which, instead of being hinged in the normal way, are arranged to slide within the body and if required stay in that position, so that in the case of a vehicle being used for such work as

The Brush "Pony" electric vehicle as used for the conveyance of milk.

door-to-door deliveries the driver can keep the door open and step in and out with the maximum of ease and the minimum of waste of time.

Perhaps the most important feature of the new Leyland Beaver is its improved oil engine, a 7·4 litre six-cylindered direct-injection unit equipped with Leyland manufactured multi-holed injection nozzles. It is claimed that the performance of this new model shows considerable improvement on those previously produced both in respect of fuel consumption, which is 0·355 pint per b.h.p./hour and power output 100 b.h.p. at the governed speed of 1,800 r.p.m. This engine has a bore of 4·375 in. and a stroke of 5 in. The gearbox affords five speeds forward and reverse, and there is provision for a power take-off for driving a tyre pump. The tyre equipment is 36 in. by 8 in. high pressure, twins on the rear and singles on the front. The machine has a carrying capacity of 7 ton and normally carries an 18 feet 6 in. platform body. It is offered as being suitable for hauling a trailer with an additional 5 ton of payload.

Interior of the Maudslay Maharanee tractor trailer showing the arrangement of the racks to carry the trays of bread.

Karrier Motors, Ltd., have introduced a new model, the CK3 3/4 tonner, which is an improved version of the 3 tonner which it replaces.

It retains the outstanding advantages of the previous model, notably its good manoeuvrability, low loading height, and ample body space. It has, however, a more powerful engine capable of developing 80 b.h.p. A feature of the engine construction is the utilisation of chrome finishing for the cylinder bores, a process which, it is stated, practically eliminates that bogey of all internal combustion engine users, cylinder wear.

The engine is a six cylinder of 85 mm. by 120 mm., bore and stroke. The gearbox provides four speeds forward and reverse. The rear axle is a fully floating bevel driven unit. In order to retain the low loading feature, which is a characteristic of this chassis, the tyres normally fitted are 27 in. by 6 in., twins on the rear, singles on the front.

The most recent addition to the Bedford range of commercial vehicle chassis is a 30 cwt., and as regards this the standard 30 cwt. van is naturally of particular interest for the transport of food.

The chassis embodies the standard Bedford 28 h.p. six-cylindered engine and gearbox with semi-floating rear axle and 32 in. by 6 in. H.D. tyres, single at both rear and front.

The body is particularly attractive in appearance, with domed roof and radiused roof corners. The body panels are of armoured plywood and the side and rear doors are fully domed. The under frame, like the framework of the body work itself, is of hardwood. The wide rear doors are so hung as to permit of a wide angle of opening. The wheel boxes are square so that the tops of them can be utilised as loading space.

The Albion 57 cwt. van provided with a full height opening door at the front offside and accommodation on the roof for empty containers.

Nineteen forty-six was the Jubilee year of John I. Thornycroft and Co., Ltd., which may possibly account for the fact that there are two Thornycrofts which must have reference in this brief review.

One of the new vehicles is a maximum load eight-wheeler designed to carry a gross laden weight of 22 ton. This has a six-cylindered oil engine, made by Thornycrofts, of direct-injection type, developing 100 b.h.p. at 1,800 r.p.m., and a maximum torque of 337 lb. at 1,000 r.p.m.

The transmission embodies two gearboxes, one of the normal type with four speeds forward and reverse and the other an auxiliary providing an additional reduction of 1·88 to 1. The rear axles, both incidentally of the driven type, embody overhead worm gear.

Air-pressure brakes operate on all eight wheels, the air pressure being supplied from a compressor through an unloader valve to two reservoirs. The tyres fitted are 36 in. by 8 in. high pressure all

A special and novel type of body built for Benskins the brewers on a Scammell eight-wheeler.

round. The Thornycroft "Nippy" class tractor chassis with Scammell 6/8 ton patent coupling and brake gear is an innovation by that well-known maker during the past year.

The design of the tractor is based on the 3 ton chassis of that name, it has a four-cylinder engine, $3\frac{7}{8}$ in. by 5 in. bore and stroke, capable of developing 68 b.h.p., a four-speed gearbox, spiral bevel rear driven axle. Tyre equipment comprises 32 in. by 6 in. heavy duty, single on the front and twins on the rear. The trailer coupling gear is of the quick detachable type so essential to maximum economical use of a vehicle of this description.

Novel Type of Chassis

A year ago a novel type of chassis, introduced by the Sentinel Company of Shrewsbury, was referred to, the engine being a horizontal one carried underneath the frame behind the driver's cab. At that time the only model offered was equipped with the petrol engine. Now there is an alternative—the four-cylindered oil engine having a bore and stroke of $4\frac{1}{4}$ in. and $5\frac{1}{4}$ in. respectively. It is stated to develop 90 b.h.p. at 2,000 r.p.m., and has a maximum torque of 255 lb./ft. at 1,500 r.p.m.

The combustion chamber is of the Ricardo Comet type, in which the swirl cell contains half the clearance volume, the other half being provided by a cavity in the crown of the piston.

The gearbox offers five speeds, of which the fifth is an overdrive. The rear axle embodies an overhead worm and wheel. The braking is on the Lockheed hydraulic system, and the tyres fitted are 36 in. by 8 in., twins on the rear.

Albion vehicles for food transport are of capacity ranging from 30 cwt. to 5 ton inclusive, the general specification being the same throughout. The 30 cwt. and 45 cwt. vehicles have four-cylindered engines of $3\frac{1}{8}$ in. and $4\frac{1}{8}$ in. bore and stroke. The 57 cwt. and 5 ton 2 cwt. models have six-cylindered engines of the same bore and stroke. All have four-speed gearboxes. The rear axles of all but the largest vehicle are of full floating type with spiral bevel gear drive, but the 5 ton 2 cwt. machine has an overhead worm, that is also of the full floating type. Lockheed hydraulic brakes are common to the first three, but the largest vehicle utilises Clayton as well as Lockheed units.

A.E.C. vehicles for food transport are generally available for loads of from 8 ton upwards. Particular interest, however, attaches to the Monarch, a four-wheeled goods chassis for 12 ton gross and usually available for a payload of slightly over 7 ton, and the Matador, also with the same load, as a solo machine, but designed for use with a trailer.

Of Austin models the ones of most interest are those for 2 ton and 5 ton. The general specification includes six-cylinder engine of bore and stroke 85 mm. and 101·6 mm., giving a maximum torque of 143 lb./ft. at 1,200 r.p.m. The gearbox provides four speeds forward and reverse, and the rear axle is fully floating with straddle-mounted spiral bevel pinion and wheel. A feature of the design of the axle is the use of shock buttresses, which are incorporated in the differential bearing housings to take additional stress. On the 2 tonner the tyres fitted are 32 in. by 6 in., and on the 5 tonner 34 in. by 7 in.

As regards Commer vehicles there is nothing further to add to what was mentioned in the previous article: they are still available in complete range from 8 cwt. to 8 ton.

The Dodge 5 tonner remains substantially as a year ago. It has a six-cylindered engine of $3\frac{7}{8}$ in. bore and $4\frac{1}{4}$ in. stroke, with a torque of 190 lb./ft. at 1,500 r.p.m. It has a four-speed gearbox transmitting to a bevel driven rear axle. The brakes are hydraulic, and the tyres 34 in. by 7 in. heavy duty.

Long Life Engine

Special claims are made for long life as the outcome of certain special features of the Dodge engine, particularly the hardened steel exhaust valve inserts, the direct water cooling on to the valve seats, and the full length water jackets.

The E.R.F. range of vehicles provides capacity from 6 ton to 15 ton inclusive. Characteristics of all models are the same, including as power unit the Gardner oil engine, five-speed gearbox, and overhead worm-driven rear axle. The brakes are Lockheed hydraulic, and tyres according to load capacity.

The most interesting Foden production during the past year has been the model DGTU 4/10, which is actually a tractor for use as the motive unit of an articulated vehicle. One of the illustrations shows this particular model coupled to a large pantechnicon type body designed for the conveyance of products which are light in weight but bulky. The advantage of the use of this type of vehicle is that as in this case two trailer units can be used in conjunction with the one motive unit, the trailer which is not in tow being loaded or unloaded while the other one is in transit, thus effecting a considerable saving in time and correspondingly in cost.

The chassis of this vehicle is very similar to the Foden type DG 6/7 7 ton four-wheeler, except that it has a Gardner engine of the four-cylinder LW type.

Other Foden models are available for payloads from 6 ton to 15 ton, and are very similar in design to those described previously.

The Ford Motor Company's range of vehicles is

largely as described previously, there having been no important innovations during the past twelve months. They are available for loads of from 5 cwt. upwards. An outstanding feature of the Ford vans for 5 cwt. and 8 cwt. is the ample body capacity.

The Maudslay range of vehicles is pretty much the same as it was a year ago. It comprises vehicles for payloads of from 7½ ton to 15 ton. All are Diesel engined and equipped with five-speed gearboxes with overdriven fifth speed.

Reference has already been made to Morris Commercial vehicles, but it is just as well to point out that they are now producing vehicles with a range of capacity from 15 cwt. to 15 ton inclusive. All models have four-cylindered engines, and there is a tractor unit which when used with an approved semi-trailer can carry loads up to 9 ton.

One of the new Thornycroft tractor trailer units in process of being loaded.

The Scammell range of vehicles is unaltered. The illustration shows a special and novel type of body constructed for a brewer. Its interest lies in the way in which the framework is lightly constructed to serve to retain the load, which in all probability will be in the main barrels, and is at the same time designed for ease of loading. In this connexion it should be noted that all the intermediate stanchions are removable, as also are the crossbars at the rear, as may be necessary to facilitate loading or unloading. Close examination will reveal the fact that there are cable strainers running from end to end of the body supported at intervals by wooden bracing pieces. By the release of a central quick-release handle on either side of the body the stanchions can be turned, the cables slackened, and then unhooked to facilitate loading or unloading either side.

Electric Vehicles

The possibility of restricting the radius of operation for the use of motor vehicles by C licensees must have the effect of turning the attention of those interested in food transport to the electric type of vehicle.

In this connexion it is of interest to note the recent linking up of the Austin Motor Co., Ltd., and Crompton Parkinson, as the outcome of which it is understood that a considerable increase in the production of electric vehicles for a variety of types and sizes is likely to accrue.

It is well known that electric vehicles are particularly economical and useful, provided that the limitations of radius are fully understood and that the use of the vehicle is strictly confined within those limits.

A reasonably comprehensive range of electric vehicles comes from the Brush Electrical Engineering Co., Ltd. One of particular interest to small operators is the "Pony" battery electric truck, which has a payload capacity of 18 cwt. and is useful for the house-to-house delivery of milk and bread and similar commodities.

A better-known product of the same company is a four-wheeler, which is built in load capacities of from 10 cwt. to 30 cwt. A feature of the Brush Electric vehicle is that it employs a parallel series battery control, which it is claimed is more economical than the rheostatic control more commonly employed. According to the Brush principle the two halves of the battery are connected in parallel while accelerating to half speed and in series thereafter. The drive from the motor to rear axle is by "Layrub" propeller shaft, and the rear axle is a double reduction having helical gears for the first reduction and spiral bevel for the second.

Another maker of electric vehicles is Midland Vehicles, Ltd. There are two models, one for a payload of from 12 cwt. to 15 cwt. and the other from 20 cwt. to 25 cwt.

Sugar from Wood Waste

INVESTIGATION of the possibilities of producing sugar from the wood waste of Australian timbers is occupying the attention of research experts in Australia, and promising indications of the practicability of using the vast quantities of the Commonwealth's unused timbers have already been noted, states a report by Charles Lynch, quoted by the *New Zealand National Review*, by courtesy of the High Commissioner for Australia in New Zealand.

Pilot Plant Tests

Prominent in the researches is the Forest Products Division of the Australian Council for Scientific and Industrial Research. In conjunction with the Council's Division of Industrial Chemistry, it has arranged for pilot plant tests of Australian timbers to be carried out in the United States. Complete reports on the investigations are expected shortly, but from preliminary information gained in Australia it is clear the yields of sugars equal to those obtained from American timbers are possible.

Researchers emphasise, however, that a considerable amount of work, especially with regard to fermentability, remains to be done.

The University of Tasmania has carried out considerable work on the treatment of Messmate Stringy-bark on a process similar to the method in use in America, and promising results have been achieved.

The possibility of this tree being a source of sugar yield is an important one to Australia, as it grows prolifically.

The species forwarded to America for the purpose of the testing processes are four—namely, Mountain Ash, Messmate Stringy-bark, Jarrah, and *Pinus Radiata*. These trees also grow in large numbers.

For some time it has been established as a scientific possibility that by the action of acids, employed under suitable conditions, the cellulose portion of wood, which amounts to approximately 75 per cent., can be converted into simple sugars, mainly glucose or grape sugar, and also xylose or wood sugar.

It is well known that glucose can be easily fermented by yeast to yield ethyl alcohol. The wood sugar, or xylose, on the other hand, while being non-fermentable by the action of ordinary yeast, has also a commercial value as a medium for growing a type of yeast for use as fodder for cattle.

It is generally agreed that no wood hydrolysis process can completely convert the substance of wood to simple sugar. In the various processes there always remains a residue of lignin, a complex substance the nature of which differs considerably from that of the cellulose portion of wood.

Utilisation of Lignin

The commercial utilisation of lignin generally is a problem which has for some time engaged the attention of the Forest Products Division of the Council, and it is also one of the questions which is being investigated by research workers in the local pulp and paper industry.

Incorporation in plastics has been suggested as an outlet for lignin, but the drastic treatments employed in wood hydrolysis invariably leave a residue that is not particularly suited to this purpose.

A profitable wood-sugar industry would require a stable market for lignin. It is believed that researchers will eventually turn lignin to advantage to both the timber and the paper pulp industry.

The market for ethyl alcohol is everywhere an established one in industry, and an assured market exists for local production.

Hydrolysis of Wood

There are three main types of processes for production of wood sugar in practical use in various countries, based upon hydrolysis of wood. These are the American method, the Scholler-Tornesch process, and the Bergius-Rheinau process.

In the first, American waste wood chips are heated in a digester with dilute sulphuric acid for a period of ten to twenty minutes at a pressure of about 120 lb. to the square inch. Approximately 20 per cent. to 25 per cent. of the dry weight of the wood is converted to simple sugar, of which 65 per cent. to 75 per cent. is fermentable.

The sugars are then leached out of the digested material, and the solution is neutralised with lime, filtered, and fermented. The resultant alcohol is recovered by orthodox distillation methods. This process has been the one most favoured in Australia.

In the Scholler-Tornesch method, the hydrolysis liquor is forced through the wood charge over a much longer period, and the pressure per square inch is increased.

High yields of sugar are obtained, as also with the Bergius-Rheinau operation, which employs 40 per cent. hydrochloric acid at ordinary temperatures.

When more information is available and the problem of the economics of the products has been solved, Australian processors will no doubt make a definite choice of the three methods of production, each of which has features of practical value.

British Commonwealth Scientific Official Conference

The establishment of a British Commonwealth Scientific Office in London is one of the main recommendations to Governments disclosed in the Report of Proceedings of the British Commonwealth Scientific Official Conference.*

The Official Scientific Conference followed on the Royal Society's Empire Scientific Conference last July. Its primary concern was to discuss scientific collaboration, which had grown up in the Commonwealth during the war, and to devise means of ensuring its continuance and improvement. Consequently most of the resolutions are of an administrative or organisational aspect rather than of direct scientific interest.

Co-operation with D.S.I.R.

Broadly, the proposal to set up a British Commonwealth Scientific Office (B.C.S.O.) in London is that the various Dominion Scientific Missions and Liaison Officers in London should occupy adjoining offices in the same building. While retaining full autonomy and responsibility to their Governments, they would be able to co-operate more easily in matters of common interest. Thus specialist knowledge which might at any time be available among the staff of one mission would be available to the other missions. The work would be carried out more rapidly and economically by the provision of certain common services such as library, typing, duplicating, abstracting, indexing, and microfilming. It is suggested that the Department of Scientific and Industrial Research should be responsible for these common services, and that the B.C.S.O., London, should at first be housed in the same building as D.S.I.R.

B.C.S.O., London, will be set up on approximately similar lines to B.C.S.O., Washington, which was established during the war. It is recommended that the latter should continue, but that its name should be altered to B.C.S.O., North America. The eventual establishment of B.C.S. Offices in other parts of the world is also forecast.

* H.M. Stationery Office, Kingsway, London, W.C.2, price 1s. 3d.

Facilitating Commonwealth Collaboration

It was agreed that permanent machinery for facilitating Commonwealth scientific collaboration and for following up the recommendations of the Conference should be provided by establishing a Standing Committee of the Conference with a Secretary and Working Party in London. The Standing Committee consists of the executive heads for industrial and scientific, agricultural, and medical research in the United Kingdom, the Dominions, and India, together with three scientific representatives nominated by the Colonial Office. The Working Party is composed of deputies of the members of the Standing Committee with the Secretary of the Standing Committee as chairman of the Working Party. This arrangement will ensure that scientific collaboration is maintained at a high pitch of efficiency.

Interchange of Scientists

One of the most potent factors in securing Commonwealth collaboration is the interplay of ideas which can only be brought about by personal contact between scientists. The general need for the interchange of scientists and students was recognised as of great importance, but the difficulties arising on such matters as pension rights, loss of seniority, etc., were recognised. In a series of resolutions the Conference made recommendations for overcoming these difficulties, including the setting up of various committees to study the questions in closer detail. With regard to the "export of brains," the Conference noted the increasing requests from territories outside the Commonwealth for expert scientific advice and for the provision of training facilities. The suggestion is made that these requests should pass through B.C.S.O., London, so that the resources of scientific manpower and of educational establishments throughout the Commonwealth can be used to the best advantage.

Medicine and Agriculture

Regarding medical research, the Conference recommended that in each Dominion there should be a body sponsored by the Government and charged with the responsibility for the stimulation, support, and organisation of medical research.

Four recommendations for appropriate action by Governments were made concerning agricultural science. Meteorological stations, equipped to measure the more important factors of moisture, temperature, and light affecting biological activity, should be established. The relationships between climatic variations and plant or animal responses should be recognised as functions of agricultural and biological research units.

The need for preliminary surveys of the extent of utilisation and of wastage of agricultural products was stressed. The Conference also drew attention to the importance of preserving native breeds of farm livestock and for the increased production of protective foods.

British Refrigeration Association

The Council of the British Refrigeration Association have appointed Mr. E. G. Batt as director of the Association with effect from March 1, 1947.

Food Manufacturers' Federation

At a recent meeting of the Council of the Food Manufacturers' Federation, Sir John Bodinnar, J.P., was elected President of the Federation for the year 1947 in succession to Lt.-Col. C. V. Jones, C.B.E., who has completed the maximum term of three years in that office.

Roadside Catering

Suggested lay-out for a café combined with a modern petrol station.

The Empire Tea Bureau, as members of the British Road Federation, now have a department to assist all roadside caterers with any general catering problems they may have. An interesting model has been designed by Cockade, Ltd., and is displayed in the Regent Street window of the Tea Centre to show how the essential road users' amenities can be planned under one roof.

One of the panels in the recent exhibition was designed to show the difficulties encountered today in obtaining rest and refreshment. Such slogans as "Dangerous pull-in—Take a chance or keep death off the road," and "Temporary shack established twenty years ago and still unsuitable to meet the requirements of any type of road user," were depicted by operating a push-button. It is felt that there is such an underlying truth in these statements that it would be dangerous to allow such haphazard catering when new roads are constructed.

Changes of Address

Mr. L. D. Galloway, M.A., has transferred his microbiological practice to 24, Welbeck Way, London, W.1. He will remain in close touch with Thomas McLachlan, whose laboratory he has shared for some time.

*

The offices of the British Tar Confederation and of the Coal Tar Research Asociation have moved to Gas Industry House, 1, Grosvenor Place, London, S.W.1 Tel.: Sloane 6119.

B.E.A. Council

At the thirty-fourth annual general meeting of the British Engineers' Association (Inc.) the result of a members' ballot showed that the Governing Council would be strengthened by the election of new members as follows:

Mr. E. Bruce Ball, Managing Director, Glenfield and Kennedy, Ltd.

Mr. C. D. H. Macartney-Filgate, Managing Director, Tubes, Ltd.

Mr. W. J. Ruston, Director, J. Stone and Co., Ltd.

British Sugar Machinery

Clydeside, which it is estimated produces something like 70 per cent. of the sugar machinery manufactured in Britain, has at present on hand orders which range in value from £3,000,000 to £4,000,000—the greater proportion of them for India.

Messrs. Mirrlees Watson and Co., Ltd., engineers, Glasgow, assess their orders on hand—cane and beet crushing machinery and condensing plant—at well over £1,000,000.

An interesting development is the manufacture in Glasgow of machinery for South of England firms specialising in the extraction of sugar from beet. Clydeside firms are also interested in the possibility of securing orders from Venezuela for up-to-date sugar machinery urgently needed in that country.

Latest Packaging Developments

Frozen foods are being more widely distributed and are meeting with increasing public acceptance in Britain. The latest developments in their packaging, both British and foreign, are included in the November issue of *Packaging Abstracts* (Vol. 3, No. 11), published by the Packaging Division of PATRA for the confidential information of its members.

A rectangular shaped package of moisture-proof cardboard is regarded as best in one discussion on the subject, summarised in the *Abstracts*, and the importance of suitable packaging is indicated by another item which points out that the quality of frozen foods is judged at the time they are eaten by the ultimate consumer.

The growing importance of wet-strength papers in packaging is also reflected by several items describing methods of manufacture or treatment of paper to give high wet-strength. Methods of making packages resistant to mould, bacteria, and insects include the use of DDT, and the results of tests of the toxicity of DDT to man and animals indicate that there is a wide margin of safety in its use as an insecticide.

World Engineering Conference

At a meeting held at the Royal Empire Society on November 29, 1946, the chairman, Mr. W. R. Howard, opened the proceedings with a brief review of the events leading up to the meeting, emphasising the fact that the World Engineering Conference had been formed at the International Technical Congress held in Paris in September last as a result of the unanimous decision of the delegates of the thirty nations represented. A letter from the chairman of the Foreign Relations Committee of the Joint Engineering Council of the American Engineering Societies was read outlining the steps taken by the American Engineering Institutions in the establishment of a National Committee. It was further pointed out that other nations were forming similar committees, and the object of this meeting was to give the Engineering and Technical Institutions in Great Britain an opportunity of considering whether British Institutions should be represented in this International Organisation or not.

After considerable discussion on the objects of the World Engineering Conference, the chairman stated that the present provisional committee desired to know if their work met with general approval, and if those present were desirous of the committee continuing in contact with the World Engineering Conference. In the event of such general support being forthcoming a further meeting would be held in January, 1947, when it was hoped the various Institutions and Councils would sponsor the new movement.

The following two resolutions were submitted to the meeting and carried unanimously:

(1) That the representatives of the Engineering and Technical Institutions, Societies, and Associations of Great Britain now present hereby approve the objects of the World Engineering Conference, and consider it advisable that a broad participation in, and co-operation with, it should be taken by all such Institutions, Societies, and Associations.

OBITER DICTA

● We shall never return to pre-war white flour.—*Sir Jack Drummond.*

● What we need is "a Merrie England," an England of beef and beer, not of Cripps's beetroot and bicarbonate of soda. —*Mr. R. A. Butler, M.P.*

● If we could only get suet we would fling our arms round Mr. Strachey's neck and kiss him. Instead, we feel like wringing his neck.—*A Sheffield housewife.*

● If ever a *B. Coli* is found in the factory, it will be so scrubbed and sterilised as to be undetectable.—*Production Manager of Golliwogs Ices, Ltd.*

● We hate to see goods come in from the Continent in decent wrappings when we cannot put them before the people in any shape at all.—*Mr. F. B. Law, County Chairman of the N.F.U.*

● *Scientist:* Give me some aceto-acetic ester of salicylic acid.

Chemist: Do you mean aspirin?

Scientist: That's right. I can never think of that name.

● Macaroni is not an Italian invention. The idea originated in China, whence it was brought to Italy by that great man Marco Polo, who knew a good thing when he tasted it.—*Philip Harben in "Cooking Quickly."*

● I never met the Marinierter herring, the Mattjes herring or the Bismarck herring that deserved to be mentioned in the same breath as a Loch Fyne kipper.—*J. W. Drawbell in "Drifts my Boat."*

● Despite all the speeches to which I have listened in the House of Lords, and in spite of all the doctors and technicians, I look forward to the day when I can have bread as white as a tablecloth.—*Lord Jowitt.*

● For so many years we have come to think that we in Britain can only make one standard of cheese that we never bother to distinguish between Cheddar, Cheshire, and Stilton cheese—it is just cheese. Possibly it might be called mousetrap cheese.—*Mr. Erroll, M.P.*

(2) That the Provisional British Committee, augmented by such further members as may be determined, shall continue to act in liaison with the World Engineering Conference, and shall, in particular, be authorised to call a further meeting to be held in January, 1947, to which all Engineering and Technical Institutions, Societies, and Associations in Great Britain shall be invited, with a view formally to constituting a British National Committee.

Lord Sempill was unanimously elected to serve on the Provisional British Committee.

The United Kingdom Glycerine Producers' Association Limited

The United Kingdom Glycerine Producers' Association, Ltd., announce that the prices of refined glycerine were advanced on January 1, 1947, by £37 10s. 0d. per ton, making the new basic prices for B.P. quality £120, and for Industrial Pale Straw £115 per ton, compared with previous prices of £82 10s. 0d. and £77 10s. 0d. The usual additions to these prices for smaller quantities and packages will be continued and the other terms of sale are unchanged.

The new prices are an attempt to approximate to a reasonable level of post-war value for glycerine in relation to the higher values of other commodities.

House Journal

First appearing in 1939, *Contact*, published monthly in Northern Ireland by the Newforge Group of food processing factories, has enhanced its status not only with the factories' personnel but also with the various groups associated with the food industry. These groups include the Ulster farming community, the food distributing and retail trades, relevant municipal authorities, and the housewife.

Well illustrated with arresting photographs and art drawings, *Contact* blends reports of the progress and activities of the Newforge organisation with a wide selection of reading material of general interest.

Dinner with the D.I.C.E.A.

About 150 guests assisted at the first social function in 1946 held by the Dairy and Ice Cream Equipment Association at the Connaught Rooms on December 18. The evening was thoroughly enjoyed by a representative cross-section of the dairy equipment industry and their ladies.

After dinner, Mr. H. A. H. Crowther, chairman and President of the Association, in a witty speech, welcomed the members and their guests. Dr. W. A. Lethem, M.C., M.D., responded for the guests, and his humorous stories evoked universal hilarity.

Gaiety was the keynote of the evening. After dinner, dancing occupied most of the evening, and "wallflowers" were the exception. Some excellent cabaret turns were given in the interval between dances.

Britain's Food

This latest booklet on *Britain's Food* (No. 3 in the "Changing Britain" series published by Cadbury Bros.) tells the story of our diet from prehistoric times to the present day, and like its predecessors, *The Industrial Revolution* and *The Struggle for Democracy*, it presents a complex subject in the simple language of pictures and charts, supported by a brief explanatory text.

The changes in Britain's food habits and food supplies caused by such factors as foreign trade, industrial expansion, rotation of crops, wars, and rationing, are dealt with in broad outline, but the book goes further than this. In the latter sections the extent of malnutrition in Britain before 1939 is discussed. The author then describes how the war-time principle of "production and distribution according to need" has guarded the nation's health during the past six critical years, and expresses the hope that "there may emerge some understanding of every individual's right to the minimum standards of diet for health."

There is told how man's ways of getting food have changed, and how successive waves of invaders helped to vary our food by introducing plants from the Continent, and how growing commerce in Europe popularised new beverages and new foods.

Particularly effective are the charts showing how much of our food was home produced just before the war and how much we depended on other countries, where our imported food came from, and how we paid for it. This "visual presentation" brings to life the import-export balance in a far more telling way than by a bare statement of figures.

The effects of diet upon health are also shown by this method. Despite Britain's improved health between 1909 and 1937—a period during which her consumption of protective and body-building foods gradually increased—malnutrition had by no means disappeared before the war. The book gives a vivid picture of the situation and a review of food changes in war-time, and also points the lesson for the future.

This latest addition to the "Changing Britain" series aims not only to arouse interest in an important aspect of our contemporary world—the modern quest for food and the right kind of food for health—but to encourage an understanding of the individual's right to the food necessary for health.

Mr. J. R. Perry

Mr. J. R. Perry, who has been general manager in Calcutta to J. H. Fenner and Co., Ltd., for some years, has now been elected to the Board of their subsidiary company, J. H. Fenner and Co. (India), Ltd.

Mr. Arthur Parkinson

The directors of Crompton Parkinson, Ltd., announce the appointment of Mr. Arthur Parkinson as an executive director. He has been with the company since 1936, apart from a period of service with the R.E.M.E. at home and in the Middle East.

Mr. Parkinson is sales manager for lamps and lighting equipment.

Tin and its Uses

New corrosion-resistant coatings of tin-zinc alloy, produced by electroplating, are featured in the current issue of *Tin and its Uses*, issued by the Tin Research Institute. A series of illustrations in full colour shows the effects of severe corrosion tests on steel sheets coated with tin-zinc alloy, in comparison with coatings of tin, zinc, and cadmium. Tin-zinc coatings as thin as 0·0003 in. give remarkable protection, but tin coatings and zinc coatings up to six or seven times this thickness show considerable rusting and white corrosion products under the same tests.

In a leading article the question "Is Tin Still Scarce?" is critically examined. It is concluded that world tin consumption will exceed current production by only a few thousand tons in the next two years, and that world stocks are now at least 100,000 ton in excess of pre-war levels. The long-term prospects for tin-ore supplies are shown to be "as well assured as are those of any other mineral."

Practical details are given of the Institute's new method of tinning cast iron, by which smooth tin coatings are obtained with appreciably better adhesion than can be achieved by traditional methods. This issue also gives particulars of the "Protectatin" process, which produces an oxide film on the surface of tinplate to protect it from rusting and from the black staining caused by some food products. As the film is invisible, a simple test has been devised to determine whether or not a tinplate specimen has been treated.

OBITUARY

It is with deep regret that we have to announce the sudden death of Mr. Frank C. Gardner, chairman of directors of Messrs. Wm. Gardner and Sons (Gloucester), Ltd., after a brief illness. Mr. F. C. Gardner had been chairman of this well-known firm of engineers since 1940, and his years of control were made more arduous by the war, when the firm's sifting, mixing, and reducing machines were being produced in great numbers for use in the manufacture of war materials for every branch of the services, in addition to the very extensive output to industry at home and abroad.

Mr. W. Leonard Hill, chairman of Leonard Hill Limited, publishers of FOOD MANUFACTURE, writes:

With the death of Mr. Gardner we lose one of our closest business and personal friends. When, as a young man, Mr. Gardner assumed his responsible position, we already had the pleasure of business relations with the company, relations which have continued through many years. Under Mr. Gardner's able direction, we have seen the company grow and prosper, and on one occasion, at a semi-public meeting, he was kind enough to pay tribute to the assistance given by the publications of this Group. On this occasion, in the presence of many distinguished visitors, he took pride in the fact that during the slump he, as managing director, had been able to avoid any dismissals of staff or reduction of salaries and wages. During recent years, Mr. Gardner did great work on many Councils and Committees associated with the war effort. He spent much time in various centres in pursuit of these activities. All this work, added to the great difficulty of maintaining an expanding war production, undoubtedly affected his health and must have been a contributory cause of his early death.

The passing of this genial and popular personality is an irreparable loss to his family and his many friends.

Stainless Steel Fabricators

At a meeting held in London recently an Association of Fabricators of Stainless Steel was formed having for its main object the promotion of the continuous and progressive improvement of the trade and the advance in the well being and status of all connected with it.

Mr. W. Van Helden, of Joseph Sankey and Sons, Ltd., was elected the first chairman, and Mr. A. W. Branch, of Metal Propellers, Ltd., vice-chairman.

An executive committee was formed consisting of the chairman and vice-chairman, and Mr. C. W. D. Swann, of S. J. and E. Fellows, Mr. L. Mountford, of F. Mountford (Birmingham), Ltd., and Mr. L. G. Weldhen, of the Taw Manufacturing Co., Ltd., and the Chamber of Commerce, Birmingham, were appointed to provide the Secretariat. The annual subscription was fixed for the first year at ten guineas.

The main points of interest are (*a*) the Association will speak for the users of stainless steel as a whole, irrespective of whether they use rivets, bars, plates, or sheets, or whether they make tanks, vessels, hollow-ware, hospital equipment, bolts, nuts, or screws; and (*b*) sub-committees will be formed to deal with any particular class of product, and in that sphere the Association can be of assistance in selling conditions, standards of quality, and the exchange of technical knowledge.

It is understood that there are already several trade associations which cover certain specific productions in which stainless steel is used, and it is not the intention to form a rival association but rather one of wider application to act for the whole trade, and it is hoped that close liaison may be made with any such associations to the general advantage of the trade.

Food Equipment

Food Equipment, Ltd., has recently been formed with a nominal capital of £2,000. The chairman and managing director is Mr. W. J. Blois Johnson, B.Sc., A.M.I.C.E., A.C.G.I., who has for the past eighteen years been closely connected with the canned food processing industries.

The new company at present specialises on installations for canning or dehydrating fruits, vegetables, fish, meat, milk, and other food products; fruit juice canning, bottling or concentration; jam making; the manufacture of all types of metal cans and containers for packing foodstuffs and the disposal of canning factory waste products.

Caterers' Consultative Council

The Caterers' Consultative Council has been formed to deal with the common problems of the catering industry, and to create an organisation within the framework of which the various organisations may, while enjoying full autonomy and freedom, speak with one voice and work together in accord for the benefit of the public, of their employees, and of the industry. The following is a list of those Associations which have decided to establish and be represented on the Consultative Council:

Association of London Clubs.
Caterers' Association of Great Britain.
Industrial Catering Association.
Main Line Railways Canteen Association.
Milk Bars Association of Great Britain and Ireland.
National Association of Master Bakers, Confectioners, and Caterers.
National Caterers' Federation.
National Federation of Permanent Holiday Camps.
National Society of Caterers to Industry.
Residential Hotels Association of Great Britain.

Membership is open to any Association in the catering industry whose size and standing are considered by the council to qualify for admission to ensure every viewpoint having consideration.

Staff Dinner

Some sixty members of the staff of Leonard Hill Limited, welcoming a deviation from the "daily round," attended an informal dinner on January 2, given by the chairman, Mr. W. Leonard Hill.

Mr. W. Leonard Hill.
Photo: Leonard Hill Limited.

Replying to Mr. T. Coates, who toasted the House in an entertaining speech, Mr. Hill gave an interesting account of the growth and work of the Group from the date of its birth. Stressing the importance of co-operation as a means of "delivering the goods," the chairman stated that without this important factor progress would be non-existent.

Advertising, accounts, books, subscriptions—none of the multitudinous departments of a publishing house was omitted from the toasting, and an enjoyable evening was brought to a conclusion with a musical programme.

Dairy Technology

Under the auspices of the Chelsea Polytechnic there has been arranged a series of lectures intended to serve the interest not only of persons engaged in the control of milk in its preparation for the consumer, but of Medical Officers of Health, Public Analysts, Food Chemists, and others concerned with milk as a foodstuff and with public health. The series comprises a course of twelve lectures on "Recent Advances in Dairy Technology," which will be held in the lecture room of the Central Laboratories at 133, Euston Road, London, N.W.1, by kind permission of the directors of the Express Dairy Co., Ltd., on Tuesdays at 6.30 p.m. They commenced on Tuesday, January 14.

The inaugural lecture was delivered on January 7 by Dr. N. C. Wright on "The Production and Handling of Milk and Milk Products in Sub-Tropical and Tropical Countries," and the following lectures have already been given:

January 14. "The Use of Hypochlorites in Dairying," J. Wolf, M.Sc.
January 21. "pH in Dairying," A. S. Freeborn, B.Sc., Ph.D.
January 28. "The Solids-Not-Fat Content of Milk," S. J. Rowland, B.Sc., Ph.D., F.R.I.C.

The succeeding lectures will be:

February 4. "Nutritive Aspects of Milk and Milk Products," S. K. Kon, D.Sc., Ph.D., F.R.I.C.
February 11. "The Utilisation of Milk in England," E. Capstick, M.C., M.Sc.,
February 18. "Ice Cream," E. Humphriss, A.R.I.C.
February 25. "Dairy Machinery," H. S. Hall, B.Sc.
March 4. "Pasteurising Equipment," J. Mathews, B.Sc.
March 11. "Veterinary Aspects of the Dairy Industry," W. R. Wooldridge, Ph.D., M.Sc., M.R.C.V.S.
March 18. "Diseases caused by Dairy Products," Prof. G. S. Wilson, M.D., F.R.C.P.
March 25. "Ministry of Health in Relation to the Dairy Industry," W. A. Lethem, M.C., M.D.
April 1. "The Economics of the Dairy Industry," J. L. Davies, B.Sc.

Fee for the course, £1.

Mr. George Irving

A representative of Walworth, Ltd., Mr. George Irving retired on December 31, 1946, after a long period of service with the company. He began in 1890 with their predecessor, H. Munzing, as a warehouseman, but since 1908 has been an outside representative. From 1921 to 1927 he was manager of the company's Glasgow Branch, and since 1927 Mr. Irving has made Birmingham his headquarters.

Packaging for Export

I.S.M.A. LEADS ENQUIRY

The committee of the Incorporated Sales Managers' Association, charged with the duty of reporting on the present position of export packaging, preparing evidence, and submitting a case to appropriate government departments, met on November 20 (see FOOD MANUFACTURE, November, 1946, p. 461). It is hoped to show that present restriction on quality and type of packaging for export may permanently affect export trade, in the belief that an extra penny spent on packing may produce an extra shilling in exports. The committee contends that the export drive cannot be maintained while quality packaging for export is not planned and ordered, and is prepared to take up the question of imports of packaging materials with the Treasury if necessary.

It is proposed to consult other interested bodies, and the committee will ask all I.S.M.A. members for facts and figures where inferior packaging has frustrated exports. Specimens of pre-war and post-war packages and, if possible, foreign competitive samples will be requested.

Two instances where restrictions had curtailed exports were brought before the notice of the committee. A company ordered 180,000 compressed steel cases. The lay-out of the factory was altered to cope with this type of packaging, which had not been used before. The makers of the cases, however, were told by the Government, without warning, to reduce the order by 90 per cent. The remaining 10 per cent. was useless to the purchasing company.

In another case a manufacturer found that owing to restrictions imposed by paper control licence he could buy packaging on a minimum standard only. This meant ordering in small quantities instead of on a long-term basis. Package costs were then uneconomic and prices had to be raised, as a result of which the manufacturer lost his export order.

Relieving Vitamin B Shortage

Two new products supplying vitamin B are being marketed by Vitamins, Ltd., shortage of which, they declare, is causing widespread sub-clinical deficiency states. At the same time all their products, except Bemax, are being packed in cartons of uniform design.

One of the new products is the Befortiss B Complex, a capsule containing 1 mg. aneurin hydrochloride, 1 mg. riboflavin, 15 mg. nicotinamide, and 0·5 mg. pyridoxin. Besides its use for fortifying diet, the capsule has been found effective in cases of seborrhoeic dermatitis, menstrual disorders, coeliac disease, and toxic goitre, as well as in frank deficiency states such as pellagra and sprue.

An adaptation of Bemax in the form of tablets, which are being manufactured to supplement its supplies, is now reaching retailers. Although dietetically similar to the original product, they have the advantage that powdery material may be utilised in making them.

A booklet giving formulae, preparation, and uses of all their products and human requirements of the vitamins they contain will shortly be available on application.

All products manufactured by Vitamins, Ltd., except Bemax, are now being packed in cartons similar to those shown above. *Photo: Leonard Hill Ltd.*

Search for Breakfast Cereals

Scottish millers are contributing £25,000 over a period of four years to develop a breakfast cereal from British sources which will compete with the finest imported products. The four oatmeal millers' associations in Scotland are combining in this effort with the flour millers, who are equally concerned to maintain the British market for British products against the attractively packed and marketed imported breakfast foods. Scots have an especial interest and oat growers and millers a vital interest in the matter, in view of the pre-war decline in porridge consumption. That tendency has been arrested, but it is inevitable that post-war competition will enforce a much greater degree of competitive trading on home millers, and that the prosperity of oatmeal milling and oat growing will depend on the success achieved in selling porridge as a breakfast food. Mr. J. Duguid, chairman of the North of Scotland Oatmeal Millers' Association, states that efforts would also be directed to marketing the by-products of the industry. He also stressed the necessity to maintain milk supplies to encourage the use of oatmeal as a breakfast food.

Modern Homes Exhibition

The 1947 Modern Homes Exhibition, employing the most modern technique in exhibition presentation, will not only give a vivid and realistic picture of the use to which the nation's skill and resources are being put in solving the problems of housing and furniture supplies, but will also deal with home-making as it affects the average man and woman of today.

The Exhibition will be opened on March 25 at Dorland Hall.

Farm Machinery in North America

MISSION'S REPORT

The Report* compiled by the members of the Farm Machinery Mission to the United States and Canada in the summer of 1945 has now been published as No. 3 in the Agriculture Overseas series.

The members of the Mission were Major T. K. Jeans, Mr. T. A. Wedderspoon, both prominent farmers and members of the Agricultural Machinery Development Board, and Mr. S. J. Wright, Director of the National Institute of Agricultural Engineering, Askham Bryan, York.

The Mission had two main objectives: to obtain first-hand information on the trends in the progress of farm mechanisation in the United States and Canada and the way in which machinery development was proceeding; and to study the organisation of development work, the relationship between research centres, colleges, and manufacturers, the training of agricultural engineers, and the part played by them in machinery development. The Report is divided into two main parts dealing with these aspects.

Two important differences between American and British practice emerge clearly from the Report: first, the manufacture of farm machinery in U.S.A. is concentrated in the hands of a few full-line production firms; second, there is a closer relationship between research workers, farmers, teachers, and manufacturers in applying the results of research in the United States.

The Report draws attention to the experimental and developmental work which is required in this country in the mechanisation of the harvesting and making of silage, with particular reference to the adaptation of modern machinery to British crop requirements, including kale; and to the possible use of meal instead of molasses or acid as preservatives. It is suggested that Britain might follow the example of the United States in attempting to obtain or develop maize hybrids for silage.

In the dairying districts visited the Mission were impressed by the fact that drainage of cowsheds and dairy barns is not compulsory and so is very seldom practised; and the Report suggests that our own dairying regulations might be revised with advantage in this respect.

Other main points which stand out in regard to the first part of the Report are:

(*a*) The ability of American farmers to do with less labour than is required in the United Kingdom appears to be due not so much to the labour-saving devices which are available in the United States as to the farm conditions, which favour a much lower labour requirement.

(*b*) The influence of the maize crop in the Middle West on the trend of farm mechanisation and the American adaptation of cropping methods to the needs of a standardised form of mechanisation.

(*c*) The great importance of silage, particularly maize silage, in farming in most of the American dairy and stock-feeding regions.

(*d*) The development of the mechanisation of the hay crop, particularly the one-man baler and the mow drying of hay. The Mission were impressed with the advantages of the one-man baler for British conditions also; the mow drying of hay is not, however, in their view, so important for Britain, and the Mission's views on this do not indicate that further research here is of first priority as compared with a number of other problems—in this they rather differ from the Farm Buildings Mission.

As regards the second part of the Report the main general points which arise are:

(1) The very close integration of crop husbandry work and machinery development which exists in the United States not only among research and experimental workers but also in the minds of suppliers of farm machinery, seeds, etc.

(2) The success of the development of American machinery by manufacturers in the States is very largely due to the favourable market and farming conditions which are not found in the United Kingdom.

(3) The very widest possible contacts with overseas institutions, particularly in Empire countries, should be maintained by the National Institute of Agricultural Engineering. The establishment of corresponding institutes throughout the Commonwealth should be encouraged.

(4) The Report gives a clear picture of the methods adopted in the United States for training agricultural engineers, and it is suggested that agricultural graduates should be sent to the United States and Canada for suitable additional instruction to turn them into farm machinery experts. It is thought that engineering graduates should receive post-graduate training designed to turn them into agricultural engineers in this country rather than in America.

* *Farm Machinery in North America*, H.M. Stationery Office, 6d. net.

Chemistry of Oils, Fats, and Waxes

Short courses of post-graduate lectures, on the "Chemistry of Oils, Fats, and Waxes," have been arranged by the Chelsea Polytechnic. Lectures on "Some Modern Aspects of the Chemistry of Oils and Fats" were delivered by Dr. J. H. Skellow, M.Sc., Ph.D., F.R.I.C., in January, and his two concluding lectures will be given on February 7 and 21.

A series of five lectures on "Modern Views on Chemistry and Technology of Waxes and Wax-like Substances," by L. Ivanovszky, is announced, the first of which takes place on February 28. The succeeding ones will be delivered on March, 7, 14, 21, and 28, at 7.30 p.m.

L. Rose and Co., Ltd.

At a board meeting held on December 16 the directors declared a dividend on the Preference shares of the company for the six months ending December 31, 1946, payable on January 1, 1947, at the rate of 6 per cent. per annum, less income tax at 9s. in the £.

Ideal Homes

The opening date for the Ideal Homes Exhibition has been arranged for March 4 and will be open to the public until March 29.

OVERSEAS

New Rice Enriching Process—

A process for treating rice with vitamins B_1, niacin, and iron to combat beri beri, pellagra, and nutritional anaemia was described by Dr. Robert R. Williams at a recent meeting of the board of directors of the American Bureau for Medical Aid to China.

Rice grains are immersed in a solution of the vitamins and then covered with an edible coating consisting of a mixture of fatty acids and vegetable proteins; this coating sticks to the rice grains even when washed. The treated grains are then mixed with ordinary rice in the proportion of 1:200.—*Reuter's Trade Service.*

A New Insecticide

A new insecticide toxicant, Toxaphene, has been announced by Hercules Powder Co. Preliminary tests indicate that the insecticide is fully as effective as DDT against certain insects and more effective against others.

Toxaphene is a chlorinated camphene, and for the past eighteen months it has been undergoing tests in more than seventy-five different locations throughout the United States under the name Hercules Synthetic 3956.

These extensive tests indicate that it can be used effectively in agricultural, household, and industrial insecticides. It is reported to be effective against such insect pests as cotton insects, tobacco horn worm, Mexican bean beetle, flies, clothes moths, and roaches.

Where both quick knock-down and residual properties are desired, the insecticide may be combined with Thanite, another Hercules toxicant.

Toxaphene is at present available only to qualified testing agencies for experimental use, and is available in eight forms: technical grade, 25 per cent. wettable powder, 25 per cent. oil-soluble concentrate, 50 per cent. water-miscible concentrate, 10 per cent., 20 per cent., and 50 per cent. dust concentrates, and Thanite plus Toxaphene.

During the war a new method of freezing ready-cooked meals was devised by which cooked food could be kept indefinitely and yet when heated is ready to serve within forty-five minutes. A service is already in operation for air liners. The illustration shows tournedos and French beans being unloaded in the freezing chamber.

Tomato Surplus Saved

How a great glut of tomatoes was saved by a concentrated effort in canning is told in the December issue of *Contact*, issued by the Newforge Organisation.

Due to the thundery, wet weather experienced in October, the grown-in-the-open Jersey tomatoes, which are peculiarly susceptible to weather changes, ripened so quickly that a serious surplus was occasioned in the Belfast market.

Arriving in Belfast at the rate of two shiploads a week, over a period of several weeks, the market experienced a glut to such an extent that local distributors were faced with the prospect of much of them going bad.

At this point, Mr. W. J. McMichael, chairman of the Northern Ireland Tomato Distribution Association, working under the Ministry of Food, decided on immediate action to save the surplus. Conference with the Canning Division of the Ministry of Agriculture resulted in an amendment to the prohibiting order re tomato canning, resulting in the Portadown Cannery of Robert Wilson and Sons (Barrhead), Ltd., being requested to step in and relieve the glut by canning 50 ton of tomatoes.

Within three days the tomatoes were canned in 140,000 tins, thus saving tomatoes which would otherwise have rotted. Such is the versatility of the canning industry that the established production set-up was able to swing from beef and carrots with a minimum of worry or delay. This fact has not been lost on the farming community, who in past years have experienced market gluts, with the inevitable slump, sometimes below cost, in market prices.

Australian Meat Exports

The British Ministry of Food has agreed to accept 25,000 ton of canned Australian meat during the year ending September 30, 1947, compared with 86,000 ton in the previous twelve months.

Australian Milk Pasteurisation

ENRICHMENT BY ULTRA-VIOLET LIGHT

Dairy scientists in Australia have been carrying out experiments on a wide range of subjects including the vitamin D enrichment of milk by ultra-violet light. The claim has been made that besides increasing the vitamin D content, the process also pasteurises the milk at room temperature. This, if it is so, might mean a great gain to dairy science, since the general method of pasteurisation is by heating and cooling, and the milk is left with a more or less definite taste.

Milk from the experimental plant was tasted and compared with untreated milk and only a very slight difference was observed, so slight that it was doubtful whether the average consumer would notice it. A plant is being installed for special tests to be made. A British bacteriologist may conduct them.

Experimental work is also being carried out on non-churned butter. By a process of heating, separating, pasteurising the cream, re-separating, and forcing the resultant 78 per cent. rich cream through a specially constructed brine-cooler, milk is converted to a liquid butter. This product flows directly from the brine-cooler into parchment-lined wooden boxes, which are finally weighed and sealed. Investigators say the butter has a clean and fresh flavour. The boxes are placed in cold store, whereupon the butter solidifies and assumes the appearance of normal fine-grained butter. After storage for six weeks a sample had excellent flavour and was preferred to the freshly made product. Scientists claim that it kept well for a year.

Pasteurisation of milk along the old lines of cooling and heating has been done for many years in Australian cities in order to ensure that city populations get their milk in a germ-free condition.

The new method is, when thoroughly tested, likely to be introduced almost universally.

Fish Oil Food Products

A secret process for removing the fishy taste so that fish oil can be used in food products may be brought up for discussion by the United Nations.

The Norwegian fish industry has the secret, but Canadian interests claim that it was really a German discovery and should therefore be shared among the allies like other patents and processes found in ex-enemy countries.—*Reuter.*

What is a Poison?

The definition of a poison has always been a vexed subject of discussion. In the U.S.A. the Manufacturing Chemists' Association recently adopted the following description:

> "A poison is a substance which, when taken by the mouth in quantities of 60 grains (4 grams) or less, or when inhaled in concentrations of less than 200 parts per million by volume in the air, rapidly jeopardises life by other than mechanical or physical action."

Ministry Announcements

Canned Meats and Soups

An Order, which came into force on December 8, 1946, amends the Meat Products, Canned Soup, and Canned Meat (Control and Maximum Prices) Orders, 1946.

The amending Order removes price control on canned soups and prescribes maximum prices for certain home canned meat products (whole meat packs, meat roll and galantine, and ready or prepared meals) which have been manufactured under licence for the past few months. The maximum prices prescribed are those at which these products are already being sold as a condition of the licences under which they are manufactured.

The Order also prescribes maximum prices for certain packs of home produced and imported canned meats, the majority of which were procured for service requirements, but as they are no longer needed for that purpose they are being released for sale on the civilian markets.

Maximum prices have also been prescribed for further packs of imported canned Vienna and pork sausages, and the maximum prices for imported canned boneless chicken or turkey have been increased.

Animal Oils and Fats

An Order, which came into force on December 8, has been made revoking the Animal Oils and Fats (Control and Maximum Prices), Order, 1943, and has re-enacted its main provisions in a new Order, the Animal Fats (Control and Prices) Order, 1946.

The new Order provides for the increase of first-hand and wholesale selling prices of dripping by £28 per ton. The retail price is increased from 8½d. to 11½d. per lb.

As from the date of the new Order it will no longer be necessary to hold a Ministry of Food licence for dealing in animal oils and fats outside the United Kingdom.

Margarine and Cooking Fat

In view of the increase in the price of refined oils and fats, the price of cake and pastry margarine and compound cooking fats to trade users will be increased by £28 per ton in respect of all permits for the eight-week period which commenced on December 8, 1946, and until further notice.

Dangers of Raw Meat

The Ministries of Food and Health advise the public not to eat pork, pork sausage meat, ham, or any pork product unless it has been thoroughly cooked.

In some districts it is customary to eat sausage meat raw spread on bread like a meat paste. This is a dangerous practice. Illness may also arise from eating pork or pork products which have been insufficiently cooked.

If pork, pork sausages, and other pork products, including ham, not bought already cooked, are thoroughly cooked there should be no risk.

Import of Spices

From December 10, 1946, the following spices consigned from any country may be imported without an individual import licence :

Aniseed	Cummin seeds
Caraway seeds	Curry powder
Cardamoms	Dill seeds
Cardamom seeds	Fennel seeds
Celery seeds	Fenugreek seeds
Chillies	Ginger (whole dry root)
Capsicums	Maw (poppy) seed
Cayenne (or red) pepper	Mace
Cinnamon	Nutmegs
Cinnamon bark	Paprika (ground)
Cassia *lignea*	Pimento (allspice)
Cassia *vera*	Turmeric
Cloves	Vanilla
Coriander seeds	

New Food Labelling Order

An Order has been made which consolidates the Labelling of Food (No. 2) Order, 1944, and its amendments. It requires the more informative labelling of intoxicating liquors and defines the liquors which may be labelled under descriptions suggesting that they are, or resemble, spirits, cocktails, sweetened liqueurs, or alcoholic cordials.

Under the Order compounded spirits sold as liqueurs must be sweetened with sugar. Mixtures containing spirits and products sold as cocktails must contain 40 per cent. proof spirit, but the Order permits the sale of wine cocktails containing 35 per cent. proof spirit, British wine cocktails containing 24 per cent. proof spirit, and alcoholic cordial containing 10 per cent. proof spirit, provided that they are not described by any name which is usually associated with a cocktail containing spirits, or with a sweetened liqueur. Artificially aerated cider and perry may not be labelled with any name suggesting that they have the character of champagne. If brandy, gin, rum, or whisky are sold at a strength of less than 65 per cent. proof spirit they must be labelled " Diluted."

After July 1 next, all intoxicating liquors must be labelled with a name or description indicating their true nature, the country of origin, and, in the case of spirits and of wine which has been processed or which has not been made from freshly gathered grapes in the district of its origin, the alcohol content must be shown. If tonic or medicinal properties are claimed, the ingredients on which the claim is based must be declared.

Resignation

When Sir John Bodinnar found it necessary a year ago to resign his full-time appointment in the Ministry of Food as Commercial Secretary and Head of the Supply Department, he accepted, at Sir Ben Smith's invitation, a part-time post of Commercial Adviser to the Minister. Sir John asked to be released from this appointment at the end of last year. The Minister has with great regret acceded to his request, realising that Sir John will still make an outstanding contribution to the public interest in his private capacity as a leading member of the food trade.

Soya Flour

An Order entitled the Soya Flour (Control and Maximum Prices) (Amendment) Order, 1946, has been made providing for an increase in the maximum price of soya flour from £52 5s. 0d. to £61 7s. 6d. per ton *ex* mill, and from 7½d. to 8½d. per lb. retail on a sale of less than 28 lb., but otherwise makes no change in the existing distribution arrangements.

Control of Ascorbic Acid

The control of the supply and distribution of ascorbic acid in this country has been transferred to the Directorate of Medical Supplies of the Ministry of Supply at Portland House, Tothill Street, London, S.W.1.

This has necessitated the withdrawal and revocation of a Circular Letter (1815 ALP/DS), issued by the Ministry of Food in March, 1944, prohibiting the supply of preparations containing ascorbic acid to Welfare Departments of factories.

The supply of ascorbic acid, it is understood, may now permit of supplies being provided for Welfare Departments, and applications for such should in future be made direct to the Directorate of Medical Supplies.

Feeding Stuffs

An Order amending the Feeding Stuffs (Regulation of Manufacture) Order, 1944, came into force on December 21, 1946. The Order prescribes a formula for the manufacture of a new cattle food to be known as National Cattle Food No. 2, which will be available for supply to consumers against coupons lodged in the proportion of one protein and two cereal.

The Order also prescribes a minimum of 10 per cent. of wheat by-products, and decreases to 10 per cent. of the minimum cereal content of all National Compounds except National Baby Chick Food. In addition, the minimum percentage of animal rich protein substances, which must be in the form of fish meal, is increased to 5 per cent. in National Baby Chick Food Nos. 1 and 2 and National Poultry Foods Nos. 1, 1A, 2, and 2A.

A minor adjustment is made in those compounds in which cod liver oil is a required ingredient in order to permit of the inclusion of a new grade of veterinary cod liver oil which is being produced.

Consequent upon the decision to authorise the manufacture of National Cattle Food No. 2, an Order amending the directions under the Feeding Stuffs (Rationing) Order, 1943, came into force on the same date.

Offal Containers

In pursuance of its policy of ensuring that the services given to retail butchers and through them to the public shall be improved as circumstances permit, the Ministry of Food has now instructed the W.M.S.A.s to proceed with the provision of containers for the carriage of home-killed offal from W.M.S.A. depots to retailers' premises in all cases where separate offal deliveries are not practicable and where other arrangements equally satisfactory to the retailers have not been or cannot be made.

It is intended that before large quantities of containers are purchased, experience should be gained of different types of containers. The provision of containers will therefore at the start be on a restricted scale, and it may be some little time before the needs of all those depots where containers are considered to be necessary can be met.

The containers to be provided will not be left in the retailers' shops; they will remain in the delivery vehicle for return to the depots. The hauliers are being instructed accordingly and retailers should not ask the hauliers to leave containers at their premises.

Sausage Casings

The Ministry of Food, in agreement with the Board of Trade, is now prepared to consider applications from any trader for licences to import sausage casings from any source. Hog casings from Canada are excluded from these arrangements, because the Ministry of Food is importing these under arrangements with the Canadian Meat Board.

Applicants wishing to import casings may either get into touch with the Association of Casings Importers, Ltd., 27, Fitzroy Square, London, W.1, or, alternatively, send the completed forms of application (Board of Trade form ILD/A) to the Ministry of Food, Meat and Livestock Division, Bryn Euryn, Dinerth Road, Colwyn Bay, from whom supplies of form ILD/A can be obtained.

The sales of casings in this country are covered by a gentleman's agreement with the distributors, but owing to shortages of hog and beef casings it has been necessary to allow these to be imported at higher prices. The distributors are, however, under an obligation to sell the casings at prices showing no more profit per bundle than that previously earned. A circular letter has been sent to the casings distributors and to the Trade Associations covering the interests of the sausage makers.

Soft Fruit Distribution

Although a substantial part of the soft fruit crop will be pre-empted for jam manufacture in 1947, it is the intention of H.M. Government that this shall be the last year of pre-emption. The arrangements in 1947 will be on lines similar to those followed in 1946.

Pre-emption will be necessary in 1947 because the prospective supplies of home-grown and imported soft fruits (both fresh and processed) will still be insufficient to meet the demand for the highly flavoured jams which are produced from soft fruits.

Prices of soft fruits, both home produced and imported, will be free of price control except during the period in 1947 when pre-emption is in force. An announcement will be made later about control prices during the pre-emption period and will apply to both home and imported fruit.

The Minister of Food and the Agricultural Department hope that this announcement will encourage growers to take steps not merely to put a stop to the reduction of the acreage under these crops but to bring about an increase at the earliest possible moment. Processors other than jam manufacturers, in particular the canning and the quick-freezing industries, will be permitted to buy a small part of the supply of soft fruit. The Minister of Food hopes that this will assist the latter industry in developing the output and marketing of its products, which in turn should be of great assistance in future to the growers of soft fruits.

Molasses, Industrial Alcohol, and Solvents

From January 1, 1947, the selling price of molasses for all purposes other than cattle feed was increased to cover the current average cost of supplies.

This will involve a considerable increase in the production cost of industrial alcohol and solvents derived therefrom, and a new Order will accordingly be issued in the near future revising the existing maximum selling prices prescribed for these commodities.

Containers and Closures

The continuance of the restrictions on the marking of metal containers and closures, as laid down in the Control of Containers and Packaging (No. 4) (General) Order (S.R. & O. 1945 No. 1509), has recently been under review. It has not been found possible, however, to modify the restrictions at present, owing to the continued shortage of materials and labour in the industries concerned, but the position will again be reviewed at an early date.

For the same reasons it has not been found possible to modify the restrictions as to types and sizes of metal containers for packing for the home market.

Under the existing Order the printing of containers for packing for the home market is restricted to two passes through a marking machine; the printing of closures, other than crown corks, to one pass through the marking machine; the printing of crown corks is restricted to such marking of a single uniform colour not making any wording or pattern or device as can be made by coating at a single operation the whole of the external surface of the crown cork (or, alternatively, the whole of the external side of the material for the crown cork) with paint. In addition, for crown corks, closures, and containers, it is permitted to coat with protective varnish (clear and/or pigmented) the whole of the external and internal surfaces (or either of them), or, alternatively, the whole of one or both sides of the material for the containers and closures.

Information and Advice

Flavouring Extracts and Fruit Essences

B.1478. *Can you please give us particulars of equipment for the manufacture of flavouring extracts, such as vanilla, cacao, herbs, etc., and also for the manufacture of artificial fruit essences?* (Norway.)

It appears that the position relating to supplies of equipment for the manufacture of flavouring extracts and fruit essences is as follows :—

1. We are not aware of any manufacturer who specialises in the production of plant for flavour and essence extraction.

2. Most manufacturers of essences build up their own chemical plant from units that they purchase.

3. The unit processes mainly involved are maceration, filtration, evaporation, distillation and recovery of solvents, separation, etc. There is no difficulty in purchasing suitable units for these operations.

4. In setting up a new plant, consideration should be given to the use of new materials which are now available and which are themselves not only free from corrosion and in this respect have an indefinitely long life, but which have the even more important advantage of not injuring the flavour or appearance of the essences by contamination. Perhaps the most suitable of all materials is Pyrex, which is obtainable in the form of pipes, stills, and condensers, and as this material is made in heavy qualities, it is found to stand up to the mechanical wear and tear of factory life. Stainless steels, such as a titanium steel or a molybdenum steel, will be unaffected by any materials that are used in the flavours industry.

Names and addresses of suppliers of appropriate equipment were provided.

Information Supplied

B.1479. *Information on gherkins and other cucumber pickles.* (Canada.)

B.1486. *Statistics of sales of rolled oats and oatmeal sold in the U.K.; also literature dealing with the subject.* (Lancs.)

B.1487. *Manufacturers of the automatic strapping machine.* (Australia.)

B.1488. *Manufacturers of a machine which will top, tail, and peel onions ready for pickling.* (Notts.)

B.1489. *Suppliers of isinglass used for clarifying soup stocks.* (N. Ireland.)

B.1491. *Manufacturers of the new sweetening material described in* FOOD MANUFACTURE. (London.)

B.1492. *Producers of sugar dried egg.* (Sweden.)

B.1496. *Suppliers of dried blood produced in this country.* (London.)

B.1498. *Manufacturers of machine for grading tomatoes used in production of tomato sauce, and of filter for straining the finished product.* (Glos.)

B.1499. *Firms supplying paper caps for jars.* (Lincs.)

B.1501. *Recipes for salad cream and lemon curd.* (Cumb.)

B.1502. *Manufacturers of saponin for food purposes.* (Ches.)

B.1504. *Information regarding sulphur dioxide as a preservative in the food industry.* (India.)

B.1505. *Manufacturers of a type of liquid glue.* (Lanark.)

B.1506. *Firms making machinery for the manufacture of jams and preserved fruit.* (London.)

B.1508. *Information regarding golden raising powder and baking powder.* (Glam.)

B.1510. *Firms supplying baking powder in bulk.* (Yorks.)

B.1512. *Suppliers of aluminium discs and waiters' trays.* (London.)

B.1515. *Manufacturers of gelatine.* (Canada.)

B.1516. *Suppliers of ceresin discs.* (Lincs.)

B.1517. *Firms supplying machines suitable for kibbling suet.* (Notts.)

B.1529. *Source of information on non-enzymatic browning in foods.* (Lancs.)

B.1532. *Manufacturers of mechanical capping machines and of Phoenix caps.* (Ches.)

B.1533. *Suppliers of a plant for the manufacture of fish pastes.* (Ayr.)

B.1535. *The composition of gravy powders and addresses of firms specialising in the manufacture of presses for the production of 2 oz. brickettes of gravy salt.* (London.)

B.1536. *Suppliers of equipment for the packing of fish in glass containers.* (Ayr.)

B.1537. *Manufacturers of labelling and box-making machines.* (Spain.)

B.1538. *Address of firm supplying electric steam boilers.* (W. Africa.)

B.1540. *Information regarding the manufacture of sausage rusks.* (London.)

B.1543. *Ice cream recipes.* (Cumb.)

B.1544. *Manufacturers of calcium propionate.* (London.)

B.1545. *Suppliers of caps for 1 lb. jam and pickle jars.* (Yorks.)

B.1546. *Manufacturers of a vacuum-operated machine for filling bottles.* (S. Africa.)

B.1547. *Formulae for fish pastes.* (Lanark.)

B.1549. *Suppliers of the photo-electric sorting machine, described in* FOOD MANUFACTURE, *January*, 1946. (Hants.)

Information Required

B.1551. *Manufacturers of a machine for metal capping over bungs in respect of 5 and 10 gallon drums.* (N. Ireland.)

Recent Patents

These particulars of new patents of interest to readers have been selected from the "Official Journal of Patents," and are published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

Specifications Published

Printed copies of the full Published Specifications may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, at the uniform price of 1s. each.

580,313. POWER AND SONS, LTD., F. A., PADMORE, J. N., PLATT BROS. AND CO., LTD., and BASSINDALE, I. B.: Tying machines for packages and the like.

580,431. FARRELL, J. F.: Slicers for bacon, bread, and other foodstuffs.

580,455. SIMPSON, H.: Hand devices for slicing or shredding vegetables and other foodstuffs.

580,561. CORNELIUS, R. C.: Potato chipping machines.

580,590. SILBERMAN, F.: Bags.

580,601. WRIGHT, G. A., and MEREDITH AND DREW, LTD.: Rotary biscuit moulding machines.

Abstracts of Recent Specifications

Improvements in or relating to the Production of Food from Plant Leaves

In pending Application No. 8269/40 (Serial No. 573,721), there is described and claimed a process according to which it is possible by mechanical means to extract from foliage a part of the protein present and precipitate this under controlled conditions to give a protein concentrate which is edible and nutritious. Only a third of the protein is extracted in this way, although the residual two-thirds is not lost since it can be fed to animals directly, or after it and its fibrous excipient has been ensiled.

The principal object of this invention is to provide a process for a more complete removal of the protein from foliage, and the preparation of a concentrate of high protein equivalent, which is edible and nutritious.

If macerated grass or other foliage is subjected to conditions favouring proteolytic digestion, and subsequently the liquid is expressed by pressure and washing, a high percentage of the total protein in the original foliage is obtained in solution either in the form of the original protein or in the form of the products of hydrolysis of such protein. The proteolytic digestion is brought about by the enzymes naturally occurring in the foliage, and it is possible therefore to conduct the process merely by subjecting the macerated grass to raised temperature alone or with the addition of water or other diluent. Preferably, however, an additional proteolytic enzyme is added, such for example as trypsin, pepsin, or papain. This latter is preferred and is suitably activated by the addition of a small proportion of a sulphide, for example sodium sulphide.

In carrying out the process of the invention the temperature of digestion preferably lies between 40° and about 60° C.

The expressed liquid and washings are not clear, but when the green-coloured suspended solids are removed by filtration or centrifuging, a pale coloured clear solution was obtained, which on evaporation gives a sticky product free from unpleasant taste or odour.

577,172. *Roland Edgar Slade, Douglas John Branscombe, William Eric Gaunt, and Imperial Chemical Industries, Ltd.*

Trade Marks

The list of trade marks of interest to readers has been selected from the "Official Trade Marks Journal" and is published by permission of the Controller of H.M. Stationery Office. The journal can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C. 2, price 1s. weekly (annual subscription £2 10s.).

HALICHOC. — 637,698. Vitaminised chocolate in block, liquid, paste, powder, and tablet form. **Harry Goldman,** trading as **Museum Drug Stores,** 69A, High Street, Godalming, Surrey; Merchant.

GEN.—640,848. Suet and dripping. **Benninga (Mitcham), Ltd.,** 33, Mortimer Road, Mitcham, Surrey.

STAR OF FREEDOM. — 641,302. Chocolate and confectionery (not medicated). **Chantry Trading Supplies, Ltd.,** Penton Hook, Staines, Middlesex; Merchants.

GLENGARRY.—641,627. Preserved meats and meat extracts. **Gedye and Sons, Ltd.,** 28-29, Nelson Street, Bristol; Merchants.

WEST LODGE.—641,796. Edible [illegible] and edible fats. **Western Margar[illegible] Ltd.,** Alliance Factory, West[illegible] Avenue, Acton, London, W. 3; Ma[illegible] facturers.

ARMBLOC.—641,936. Eggs, che[illegible] cream, jellies (for food), dead poult[illegible] meat extracts, canned and bott[illegible] fruits, canned and bottled vegetab[illegible] canned and bottled fish, canned [illegible] bottled meat, and pickles. **Arm[illegible] Bloch and Co., Ltd.,** 48-50, To[illegible] Street, London, S.E. 1; Import [illegible] Export Provision Merchants.

DANCANA.—642,505. Bacon [illegible] ham. **John Sharphouse and S[illegible] Ltd.,** 12, Providence Street, Wa[illegible] field, Yorkshire; Merchants.

SUPREN.—642,670. Bread. **Steve[illegible] Bakeries, Ltd.,** Clapham House, [illegible] bany Road, London, S.E. 5; Bak[illegible] and Confectioners.

New Companies

J. and R. Dawson (Manchester) Limited. (416009.) 11-13, Brough[illegible] Street, Blackfriars Road, Salford, [illegible] To carry on bus. of manufacturers [illegible] and dealers in self-raising flour, [illegible] cream, and custard powder, etc. Nom. cap.: £2,000 in £1 shares. Dirs.: F. Sutton, 44, Riley Avenue, Great Moor, Stockport; S. D. Hul[illegible] 49, Parsonage Road, Heaton Moo[illegible] Stockport.

B. Runton and Sons, Limited (416132.) Fairfax Works, 105, E[illegible] Road, Leeds. To take over bus. [illegible] manufacturing confectioner carried [illegible] at Leeds by B. Runton. Nom. cap. £3,000 in £1 shares. Dirs.: F. Ru[illegible] ton, 18, Alwoodley Gardens, Leed[illegible] B. Runton (permt. mang. dir.), a[illegible] Elizabeth Runton, both of Hill Te[illegible] Bungalow, Rakehill Road, Scholes.

M. Dixon and Son, Limited (416453.) To manufacture, compoun[illegible] blend, pack, import, and export flou[illegible] baking, custard, and blancmang[illegible] powders, etc. Nom. cap.: £10,00[illegible] in £1 shares. Dirs.: C. H. Lingard, 103, Campden Crescent, Cleethorpes, Lincs. (permt.); H. R. Dixon, 171, Mill Road, Cleethorpes, Lincs.

Rayners (Caterers), Limited. (416635.) 61, Far Gosford Street, Coventry. To take over bus. of manufacturers of and dealers in potat[illegible] crisps carried on at Coventry by B. C. H. Rayner. Nom. cap. £2,500 in £1 shares. Permt. dirs.: B. C. H. Rayner, 2, Faknell Avenue, Coventry; A. G. Dobson, 59, Stra[illegible] ford Street, Coventry.

Taken from the Daily Register, compiled by Jordan and Sons, Limited, Company Registration Agents, 116, Chancery Lane, London, W.C. 2.